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## Microbiological Analysis

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**Abstract:** Multiple failures of the levee system protection for the City of New Orleans in the aftermath of Hurricane Katrina in August 2005 led to the flooding of the metropolitan area. The floodwaters and sediments contained some dissolved and entrained chemical and microbial contaminants. Subsequent pumping of floodwater from the city to the adjacent environment and the ongoing removal of sediment and sediment-coated debris are potential mechanisms to distribute these contaminants to the local environment. The recalcitrant hydrocarbon benzo[a]pyrene (BaP) was used as an indicator of hydrophobic organic contaminants and microbial and sterol indicators of fecal material to assess sources and sinks of these classes of contaminants. These data provided a basis for contaminant transport and fate models. Additionally, this report specifically focuses on the Violet Marsh area outside the levee from the Lower Ninth Ward of New Orleans and on the Chalmette area of St. Bernard Parish, looking at potential environmental impacts.

Water fecal coliform counts (colony forming units (cfu) per 100 mL of water) ranged from 100 to 490,000 (mean=21,381, standard deviation =74,541, median=2,200) in New Orleans proper, 10 to 30,000 (mean =3,308, SD=8,093, median=200) in New Orleans East, and 17 to 25,000 (mean=1,287, SD=4,381, median= 100) in St. Bernard Parish and the Lower Ninth Ward polders. The LADEQ primary contact recreational water quality criterion for fecal coliforms is 400 cfu/100 mL. Floodwater in all three polders frequently exceeded this standard, and no trend (increasing or decreasing cfu/100 mL) was evident with time as the water was pumped out. BaP levels in water (µg/L) were all non-detect except one data point at 0.42 µg/L in New Orleans proper. BaP is a hydrophobic organic contaminant that would tend to sorb to sediment particles and settle from the water standing in the city.

Comparison of the levels of indicators in the surface of sediment cores to those in the bottoms of the cores shows that Violet Marsh has had a history of fecal and BaP contamination, much presumably coming primarily from the sewage treatment plant that drains into Bayou Bienvenue. The flooding of New Orleans and the subsequent pumpout resulted in higher levels of fecal material and BaP in the surface sediments of the marsh and a wider distribution of these contaminants throughout the marsh.

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# Summary

Multiple failures of the levee system protection for the City of New Orleans in the aftermath of Hurricane Katrina in August 2005 led to the flooding of the metropolitan area. The floodwaters and sediments contained some dissolved and entrained chemical and microbial contaminants. Subsequent pumping of floodwater from the city to the adjacent environment and the ongoing removal of sediment and sediment-coated debris are potential mechanisms to distribute these contaminants to the local environment. This report focuses on the analysis of several specific contaminants that, due to the frequency and levels that they were reported to be present in the flooded city and their ability to cause environmental harm, provided the opportunity to evaluate the environmental distribution of contaminants that resulted from the failure of the New Orleans levee systems.

Data on the recalcitrant hydrocarbon benzo[a]pyrene (BaP) and indicators of potentially infectious sewage waste were gathered and analyzed. First, the levels of these contaminants in three different drainage areas (polders) in the flooded city and the trends in changes in their levels were determined as the city was pumped out. The reduced data were provided to the U.S. Army Engineer Research and Development Center (ERDC) environmental modeling group for use as source terms in their corresponding analyses of the distributions and potential impacts of these contaminants of the environment surrounding New Orleans. This environmental modeling information is presented in a separate report (Dortch et al. 2006). Further analyses of the chemical contaminants are presented in a separate chemical analyses report (Bowley et al. 2006). This report also presents data on these contaminants produced from the authors' sampling and analysis of the Violet Marsh outside the levee from the Lower Ninth Ward of New Orleans and from the Chalmette area of St. Bernard Parish, and discusses potential environmental impacts.

Due to the strategy used to pump out the flooded city and the hydraulic flows resulting from this operation and the levee systems, the flooded city of New Orleans was divided into three separate drainage areas or polders: New Orleans proper, New Orleans East, and St. Bernard Parish and the Lower Ninth Ward. The unified Katrina database of the

U.S. Environmental Protection Agency (EPA) and the Louisiana Department of Environmental Quality (LADEQ) database was used to determine the levels of fecal coliforms and BaP in the waters and sediments in each of these three polders, and changes in their levels as the city was pumped dry. Water fecal coliform counts (colony forming units (cfu) per 100 mL of water) ranged from 100 to 490,000 (mean=21,381, standard deviation=74,541, median=2,200) in New Orleans proper, 10 to 30,000 (mean=3,308, SD=8,093, median=200) in New Orleans East, and 17 to 25,000 (mean=1,287, SD=4,381, median= 100) in St. Bernard Parish and the Lower Ninth Ward polders. The LADEQ primary contact recreational water quality criterion for fecal coliforms is 400 cfu/100 mL. The floodwater in all three polders frequently exceeded this standard, and no trend (increasing or decreasing cfu/100 mL) was evident with time as the water was pumped out.

Health advisories were issued during the flood and effects were seen. Of the 10,047 New Orleans patient visits during and immediately after the flooding for which information was available to the Center for Disease Control and Prevention, the most common were due to gastrointestinal, acute respiratory, and skin infections. Analysis of the EPA/LADEQ database showed BaP levels in water (µg/L) were all non-detect except one data point at 0.42 µg/L in New Orleans proper. BaP is a hydrophobic organic contaminant that would tend to sorb to sediment particles and settle from the water standing in the city. The EPA Region 6 water quality criterion MCL for BaP is 0.20, which was exceeded by one sample. Analyses of the EPA/DEQ data resulted in medians and protective 95-percent upper confidence level values of 70,000, 33,000 and 1,700 cfu/100 mL for the environmental modelers to use as source term load values for water pumped from New Orleans proper, New Orleans East, and St. Bernard Parish and the Lower Ninth Ward polders, respectively, and non-detects for the medians and 95-percent upper confidence levels of BaP in each polder.

In order to assess the potential impacts of pumping contaminated water and sediment from the city on local ecosystems, ERDC collected sediment core samples from Violet Marsh, analyzed them for markers of infectious waste and BaP, and attempted to identify sources of these contaminants in the Lower Ninth Ward and the Chalmette area. Undisturbed sediment cores were collected from ditches draining the Murphy Oil Corporation property in Chalmette and the outfall of the New Orleans metropolitan

sewage treatment plant over the levee from the Lower Ninth Ward to profile these two potential contaminant sources. Core samples were collected from both the immediate influent and immediate effluent of the pumps that could have transported contaminants from these two sources into Violet Marsh. Sediment core samples were also collected at various distances from these pumps out into Violet Marsh to determine the range of transport of these contaminants into the Marsh. Contaminants in sediments in the top of the cores were used to indicate the most recently deposited contaminants. Sediments in the bottom of the cores were used to indicate contaminants deposited before the failure of the levees.

BaP levels (µg/gm dry weight) in sediments taken from the bottoms of the sediment cores ranged from non-detectable to 11.8 (mean=1.5, SD=3.6, median=0.0). Nine of the 18 sediments from the bottom of the cores exceed the EPA sediment quality criterion (0.062 µg/gdw), and six of these 18 exceeded the LADEQ criterion (0.33). BaP levels in top sediments ranged from non-detect to 31.2 (mean=2.8, SD=7.1, median=1.1). The most recently deposited sediment exceeds the EPA criterion in 16 of the 18 sediment samples and the DEQ criterion in 14 of the 18 sediment samples. Violet Marsh apparently has had a history of BaP contamination that could have been made worse by the failure of the levees. This BaP contamination appeared to have entered Violet Marsh through Bayou Bienvenue and not through the pumps (e.g., pump #6) that would have removed water contaminated by the Murphy Oil spill.

The potential for the presence of infectious waste was indicated using two different approaches, viable indicator bacteria (total coliform, fecal coliform and fecal streptococci) and fecal sterols. Fecal streptococci exceed the detection limits in only one surface sediment sample (Murphy Oil). All the Bayou Bienvenue surface sediment samples were below the detection levels for all viable bacterial indicators measured. Total coliform and fecal coliform measurements indicated a current input of potentially infectious waste from Chalmette into Violet Marsh. None of the five surface sediment samples from Bayou Bienvenue exceeded the 40 CFR 503 Biosolids criterion of 1,000 cfu fecal coliform/gdw. All 12 of the remaining surface sediment samples from the Violet Marsh and Chalmette exceeded this 1,000-cfu fecal coliform criterion.

Fecal sterols provided an alternative means of assessing the impacts of infectious waste derived from fecal material. Coprostanol is formed from

cholesterol in the human gut track and is the most abundant sterol (40-60 percent) in human feces (averaging 3,430 μg/gdw). Environmental scientists have suggested environmental quality criteria ranging from 0.1-1.0 nmole coprostanol/gdw. The sedimentary coprostanol levels measured in this study were comparable to those of other sewage-impacted wetlands. The coprostanol levels in sediments from the bottom of the cores ranged from non-detect to 61.2 nmol/gdw (mean= 16.9, SD= 23.1, median= 8.0). Fifteen of the 18 sediment samples from the bottom of the cores were greater than the most lenient criterion suggested as 1.0 nmol/dgw. Historically, the Bayou Bienvenue (sewage treatment plant) has been the major contributor of fecal material to the marsh, with the Chalmette pump stations playing a lesser role. The coprostanol levels in sediments from the tops of the cores ranged from 3.0 to 61.3 nmol/gdw (mean= 20.2, SD= 14.4, median= 20.7). All 18 sediment samples from the top of the cores were greater than that of the suggested criterion of 1.0 nmol/gdw. The coprostanol levels in the upper sediment indicated that the operating pumps may have recently contributed relatively more fecal material to the marsh.

The work presented here begins to provide an objective framework and first impression of some of the most obvious environmental consequences of the failure of the levee system around New Orleans and the subsequent pump-out operations. Although the levels of fecal coliform bacteria were frequently high above the regulatory concern level for recreational use, these levels are expected to abate with distance and time. However, fecal coliform bacteria are not a good predictor of human disease in estuarine water, and we are only beginning to understand the environmental parts of the life cycles of microbial pathogens of humans. The absence of environmental impacts shown from the fecal coliform bacteria data should not be interpreted as an absence of environmental impact. This report shows that Violet Marsh has had a history of fecal and BaP contamination, much presumably coming primarily from the sewage treatment plant that drains into Bayou Bienvenue. The flooding of New Orleans and the subsequent pump-out resulted in higher levels of fecal material and BaP in the surface sediments of the marsh and a wider distribution of these contaminants throughout the marsh. While the data supported these general conclusions, time and financial constraints required the authors to make major assumptions, precluded sufficient replicate analyses, and minimized the number of Violet Marsh locations sampled and the number of different analyses performed on each sample. Inclusion of analyses of recalcitrant

hydrophobic compounds in addition to BaP would enable more accurate sediment source tracking. Additional analyses are required to remove the uncertainty due to assumptions made and the minimal statistical design of the Violet Marsh survey, and to better quantify these impacts.

# Preface

This report provides an analysis of pathogen indicator data collected in New Orleans and vicinity by various government agencies before, during, and after Hurricanes Katrina and Rita. It also presents and interprets data collected by the U.S. Army Engineer Research and Development Center's Environmental Laboratory (ERDC-EL) on chemical and microbiological impacts to Violet Marsh as a result of the dewatering of New Orleans. These studies were designed to help understand the environmental consequences of the flooding and subsequent dewatering of New Orleans.

This study was conducted as part of the Interagency Performance Evaluation Task Force (IPET) performance evaluation of the New Orleans and Southeast Louisiana hurricane protection system. This study fell under Task 9, Consequences Analysis, which dealt with environmental, economic, human health and safety, social, cultural, and historic consequences of the event. The U.S. Army Corps of Engineers was responsible for executing the IPET, and the Corps' Institute for Water Resources (IWR) was responsible for Task 9. The study was funded by IWR.

This study was conducted by Dr. Herbert Fredrickson of the Environmental Processes Branch (EPB), Environmental Processes and Engineering Division (EPED), ERDC-EL. The work was conducted under the general supervision of Dr. Terry Sobecki, Chief, EPB; Dr. Richard E. Price, Chief, EPED; and Dr. Beth Fleming, Director, EL. Dr. Barbara Kleiss of the Wetlands and Coastal Ecology Branch, Ecosystem Evaluation and Engineering Division, EL, was the ERDC point of contact for the environmental consequences work of IPET Task 9. This report was prepared by Dr. Herbert Fredrickson, Mr. John Furey, and Mr. Chris Foote. The report was reviewed by Dr. Terry Sobecki.

COL Richard B. Jenkins was Commander and Executive Director of ERDC. Dr. James R. Houston was Director.

# 1 Introduction

## IPET relevance

During the period when New Orleans was flooded and during the period when the floodwaters were being pumped out, the U.S. Environmental Protection Agency (EPA) and the Louisiana Department of Environmental Quality (LADEQ) collected hundreds of samples of water and sediment and analyzed these samples for a long list of potential contaminants. The flooded area under consideration is the urbanized area on the east side of the Mississippi River, seen north of the river in Figure 1.

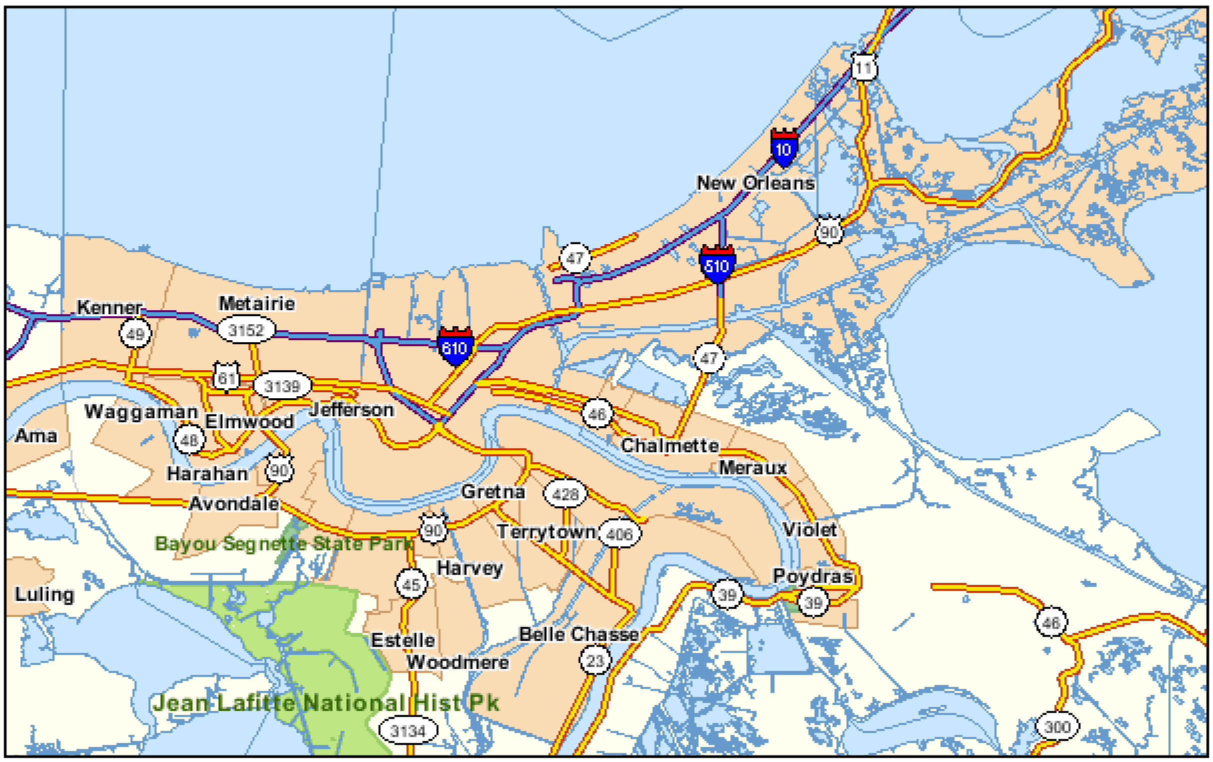


Figure 1. Map showing the New Orleans area.

Of all the water quality parameters measured, only a few stood out as a cause for concern for people coming into contact with water and sediment in the city, or to areas receiving the water as it was pumped out of the city. Elevated levels of bacterial indicators of pathogens derived from sewage were well above the concern levels in many areas of the city, which resulted in special warnings from the EPA that were posted on EPA's Katrina website. Petroleum hydrocarbons were also frequently detected.

Benzo[a]pyrene (BaP) is a particularly mutagenic polycyclic hydrocarbon (PAH) that was frequently detected in these samples. A major oil spill occurred at the Murphy Oil Corporation in Chalmette when a storage tank slid from its foundation during the flood.

To address the charge of determining the environmental effects of the failure of the New Orleans levee system, the authors focused on several indicators of infectious waste derived from sewage and BaP. These contaminants were chosen because 1) they were frequently detected above regulatory concern levels in flooded New Orleans; 2) some of these analytes were targeted by EPA and LADEQ in their water and sediment analyses so the data coverage with respect to space (inner regions, near regions and far regions) and time (pre-Katrina and after Katrina) were some of the best available; 3) some of the analytes retain fingerprint-type identifying information on sources and processes; and 4) they are contaminants that affect both human and environmental health.

## Scope and structure of report

The microbiology portion of the IPET Task 9 Consequences Assessment was included in the Section 3.4 Environmental Subtask. Indicators of changes and levels of selected pathogens and other contaminants in sediment were identified. Existing data were consolidated. Suggested values and statistics were provided to environmental modelers, and corroborative data were collected to help determine the potential for impacts indicated by microbiological considerations in the environmental consequences of levee failure.

The most urbanized portions of the metropolitan area of New Orleans are protected within the innermost confines of a complex system of levees. As indicated in Figure 2, the levees radiating from the turning basin in the Inner Harbor Navigation Canal (IHNC) provided a consistent basis to consider the urbanized portions divided into three main polders. This inner ecosystem has historically high levels of urban soil contamination, including metals and PAHs (Mielke et al. 2004). New Orleans proper is considered to be that portion of Orleans Parish west of the IHNC, while New Orleans East is the urbanized area of Orleans Parish east of the IHNC and north of the Intracoastal Waterway leading to the Mississippi River Gulf Outlet (MRGO). The urbanized areas east of the IHNC and south of the Intracoastal Waterway are primarily the Lower Ninth Ward of Orleans Parish and the Chalmette area of St. Bernard Parish. Many of the normal

pumps that operate to drain the New Orleans area failed due to the effects of Katrina and the aftermath. The normal operating pumps and the emergency pumps that pumped out flooded New Orleans proper and New Orleans East drain into Lake Pontchartrain. This nearby ecosystem was impacted as discussed in the environmental modeling report (Dortch et al. 2006).


Figure 2. Map illustrating the drainage areas.

Only Pump Stations #3 and #6 operated in the aftermath to drain the flood from the Lower Ninth Ward and Chalmette polder, pumping over the levee into the marsh beyond. Bayou Bienvenue winds through the marsh from the north near the municipal sewage treatment plant. The marshy area east of the levee and west of the MRGO is often accessed primarily by the Violet Canal to the south, and is referred to uniformly as the Violet Marsh in this report. This nearby ecosystem was impacted as discussed in the environmental modeling report (Dortch et al. 2006).

Several further outlying areas, including the Mississippi Sound and the Mississippi River Delta, are likely to have environmental impacts from the levee failures that are more dilute than the nearby ecosystems. These more remote ecosystems are not modeled in this report, and samples were not collected from the remote areas.

## Conditions to be considered by task

The Task 9 Consequences Assessment Team envisioned three conditions: pre-Katrina conditions, actual Katrina conditions with levee failure, and hypothetical Katrina conditions without levee failure. However, this subtask only has data to analyze from pre-Katrina conditions and actual Katrina conditions. Modeling may predict some of the hypothetical conditions without levee failure.

Regarding the pre-Katrina conditions, the soil of the inner ecosystems has been well studied, particularly in a series of studies by Prof. Howard Mielke of Tulane University. The surface waters in the inner ecosystems have been less reported, although the measured concentrations in the Katrina storm water pump-out were reported to be similar to normal rainfall pump-out (Pardue et al. 2005). The Lake Pontchartrain Basin Foundation provided historical water quality data to validate the environmental modeling that established pre-Katrina conditions in Lake Pontchartrain (Lake Pontchartrain Basin Foundation 2006). There was a lack of corresponding published data from Violet Marsh. The sediment data collected for this report were intended to provide a partial remedy for that void. The topmost portion of the collected sediment cores was expected to be the most recently deposited. Sediments in the bottom of the cores were used to indicate levels of contaminants that may have been historically deposited before the failure of the levees. However, to this point the collection and analyses of these sediments have been limited by constraints in funding and reporting time. The data interpretations in this report serve mainly to develop hypotheses which, when warranted, should be tested with more detailed studies using appropriate experimental and statistical designs.

## Bacterial indicators of infectious wastes

Prior to 1986 EPA recommended the use of fecal coliform as a water quality indicator to help prevent bathers from contracting gastrointestinal illness from recreational waters. These bacteria often did not cause illness directly, but demonstrated characteristics that made them useful as indicators of the presence of microorganisms that did cause these illnesses. In 1986 EPA published “Ambient Water Quality Criteria for Bacteria” where they revised their recommendations of indicator bacteria. In this document EPA recommended the use of *Escherichia coil* as an indicator in fresh water and enterococci for both fresh and marine recreational waters.

These revisions were based on epidemiological studies conducted by EPA, which evaluated the use of several indicator microorganisms. Accidental ingestion of recreational water was the most prevalent exposure pathway. The most common bacterial infections contracted in this way included cholera, salmonellosis, shigellosis, and gastroenteritis. Common viral infections included infectious hepatitis, gastroenteritis, and intestinal disease caused by enterovirus. Protozoan infections included cryptosporidiosis, amoebic dysentery, and giardiasis.

Many federal, state, local and tribal organizations were slow to adopt EPA's 1986 guidance so in 2002 EPA published "Implementation Guidance for Ambient Water Quality Criteria for Bacteria" (USEPA 2002) to assist these organizations in implementing the 1986 recommendations. The amendment to the Clean Water Act known as the Beaches Environment Assessment and Coastal Health (BEACH) Act required coastal and Great Lakes states to have adopted EPA-recommended water quality criteria by April 2004. The National Academy of Science's National Research Council (NRC 2004) recommended that the current use of indicator microorganisms be supplemented with the use of a tool box of microbiological, molecular biology and analytical chemistry techniques to better enable the protection of public health as mandated by the Clean Water Act and the Safe Drinking Water Act. Regulatory criteria are expected to transition from earlier indicator-based measurement to more direct and defensible criteria. This shift is reflected in the EPA document "Standardized Analytical Methods for use During Homeland Security Events" (USEPA 2004a) where microbial indicators are used in the early stages (triage and screening) of a response, and methods that can provide more quantitative information with respect to microbial risk assessment (International Life Science Institute (ILSI) 2000) are to be used in the determination stage of the response.

## Use of fecal sterols as indicators

In many circumstances microbial indicators are not suitable for determining fecal pollution. The use of fecal coliform as indicators in tropical waters was shown to be particularly problematic because some indicators may grow in such waters (Isobe et al. 2004). Studies of runoff from New Orleans into Lake Pontchartrain have shown that many indicator bacteria are associated with particles in the water column and quickly settle to the sediment where resuspension of the shallow waters serves as a secondary source (Jin et al. 2004). Logistical constraints are imposed by the fact that

samples cannot be stored for long periods of time before culture and analysis. Live bacterial indicators do not persist over long periods of time in the environment so it is not possible to reconstruct historic records of previous impact using this approach. Because humans as well as many animals produce fecal bacterial markers and contribute them to the environment, it can be difficult to distinguish different sources of environmental fecal contamination using these markers.

Biochemical markers such as fecal sterols offer important advantages in selected applications. The average human excretes 0.2–1.0 g coprostanol per day (Walker et al. 1982). Coprostanol comprises 4–60 percent of excreted fecal sterols and averages 3.43 mg/gram dry weight of feces (Nichols et al. 1996). Coprostanol is produced from the hydrogenation of cholesterol by bacteria in the digestive system (Eneroth et al. 1964, Murtaugh and Bunch 1967). In aerobic water columns coprostanol is microbially degraded and half-lives of <10 days at 20$^{o}$ C have been reported (Isobe et al. 2004). However, coprostanol, like other fecal sterols, is hydrophobic and associated with particulate matter in sewage and water columns (Takada et al. 1994). Coprostanol is readily incorporated into bottom sediments, where it has been shown to persist under anaerobic conditions without significant degradation for over 450 days at 15$^{o}$ C (Nishimura and Koyama 1983). Coprostanol can serve as a useful biochemical marker for determining current and long-term inputs of fecal matter to aquatic systems (Arscott et al. 2004). Based on surveys of rivers in the United States and Canada, environmental scientists have recommended three different environmental quality criteria for coprostanol; 40 ppb (1.0 nmol/gdw, Kirchmer 1971); 20 ppb (0.52 nmol/gdw, Murtaugh and Bunch 1967); and 0.5 ppb (0.13 nmol/gdw, Dutka et al. 1974).

The same GC/MS analysis used to determine levels of coprostanol can produce data on other fecal sterols and non-fecal sterols. The resulting sterol profile can provide additional useful information on the nature of the fecal pollution (Nichols et al. 1996). Ratios of coprostanol to cholesterol that are greater than one have been used as an indicator of fecal contamination in aquatic systems. Figure 3 illustrates the formation processes and transformations of several fecal sterols. The formation of epicoprostanol is favored in sewage treatment plants and the ratio of epicoprostanol to coprostanol has been suggested for use as an indicator of input of treated sewage relative to untreated sewage. Although coprostanol is directly

formed in the human gut by the bacterial reduction of cholesterol, it can also be formed under environmental conditions in a multi-step process where cholestenone is an intermediate. The 5β/(5β+5α) cholestan-3-one ratio has been recommended for use in highly productive aquatic systems with relatively low levels of coprostanol (Grimalt et al. 1990).

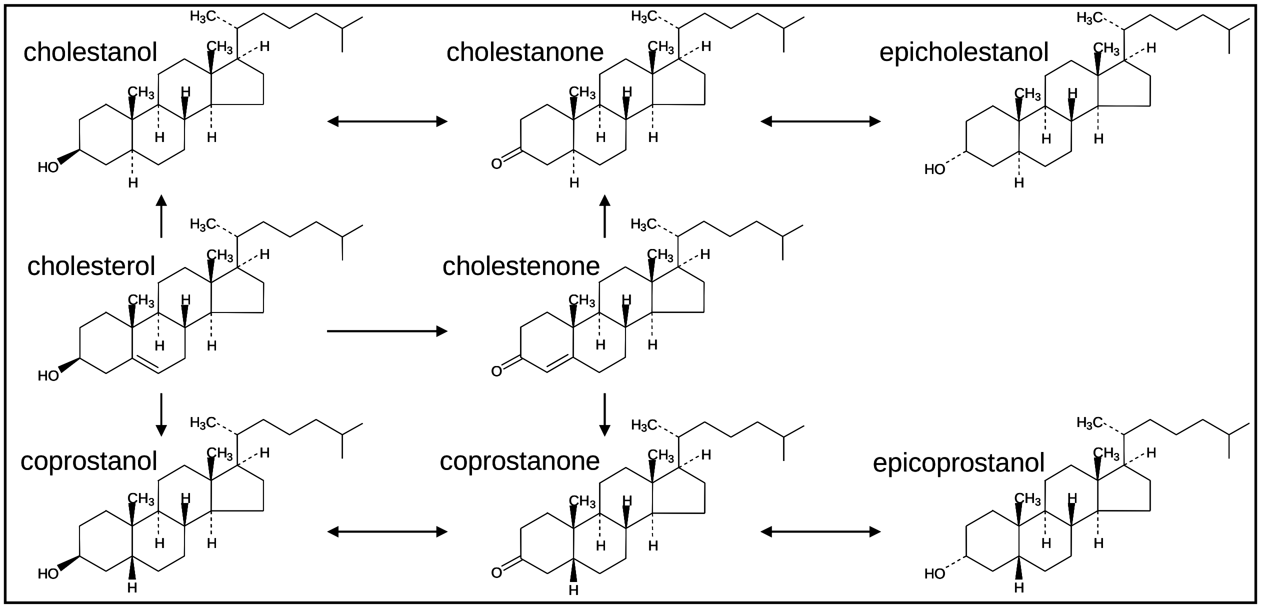


Figure 3. Structures and transformation pathways of some fecal sterols.

## Benzo[a]pyrene as hydrocarbon tracer

BaP is one of the 16 EPA designated priority pollutant polycyclic aromatic hydrocarbons (PAH; EPA Method 8310). It is a 5-ring PAH with a molecular weight of 252 u. and, due to transformation products formed during liver metabolism, it is the most carcinogenic known of the 16 (Irwin et al. 1997). Depending on the relative levels, much of the regulatory concern from total PAH contamination often devolves upon the BaP. Usually the other PAHs are assigned BaP equivalency factors for the purposes of toxicity assessments. Over 100 PAHs are commonly found in environmental samples. These PAHs are all hydrophobic and recalcitrant, with heavier PAHs being more hydrophobic and recalcitrant.

Many other hydrocarbons are found along with PAHs. Usually the most common petroleum hydrocarbons are gasoline range alkanes with 6 to 12 carbons, diesel range alkanes with 12 - 28 carbons, and lubrication oil range with 28 - 36 carbons. Many of the lower molecular weight alkanes are volatile, and most are amenable to microbial degradation in various

environmental media. Thus, recalcitrant hydrocarbons such as PAHs can serve as longer-term indicators of petroleum hydrocarbons, or more generally, industrial activity.

BaP occurs with several other 5-ring PAHs with a molecular weight of 252. Figure 4 shows a portion of the raw GC/MS data, selected ion 252, from a Violet Marsh sediment sample with a relatively low BaP value of 0.76 µg/gdw. Of the six 5-ring PAHs with molecular weight 252 shown, BaP is the fifth one, near retention time 33.1 minutes. These PAHs all have simple mass spectra with strong molecular weight base peaks.

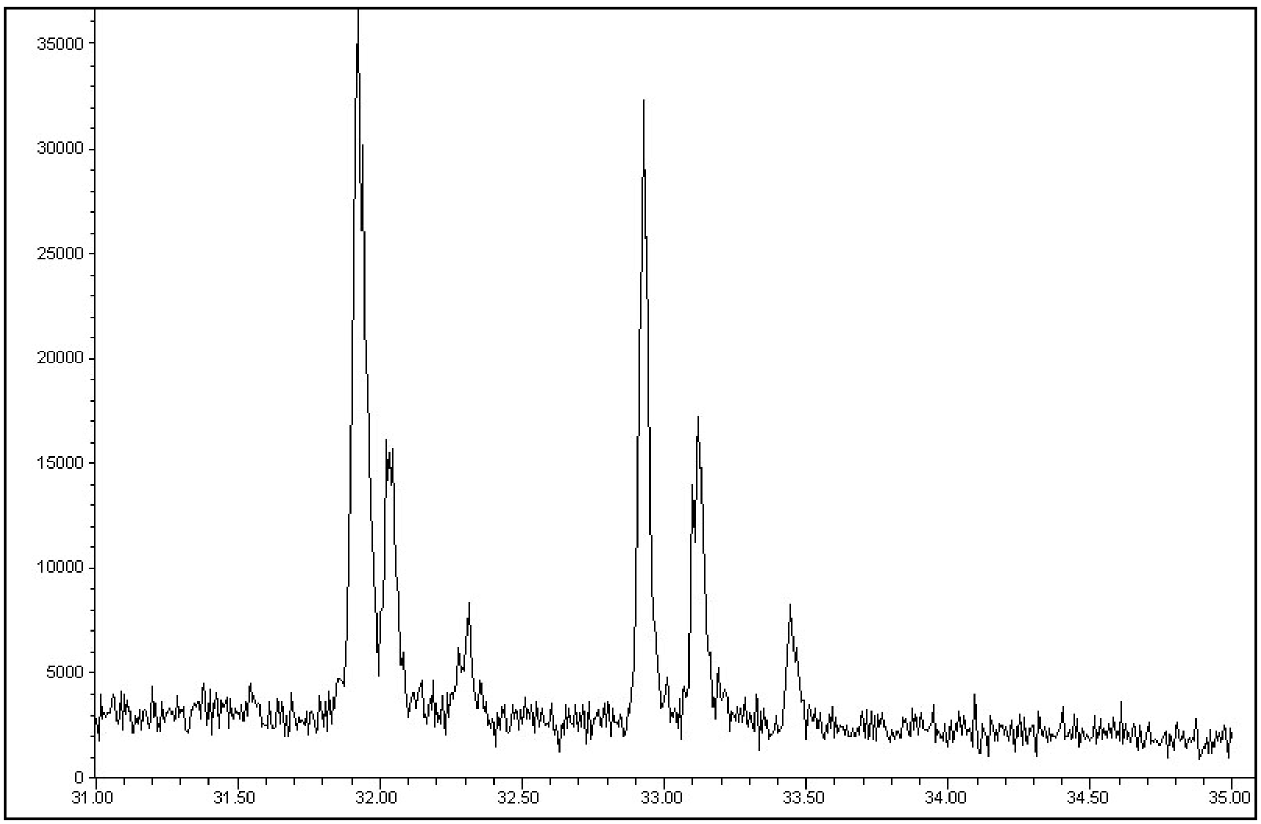


Figure 4. Selected ion (m/z=252) chromatogram of Violet Marsh sediment extract.

The proper aromatic Simplified Molecular Input Line Entry System (SMILES) description of the linked BaP molecule is c1\cc2\cc/cc3ccc4cc5ccccc5c1c4c23. The BaP structure is shown in Figure 5. The environmental recalcitrance and the lack of daughter ions in the mass spectra are due to the visibly highly aromatic structure.

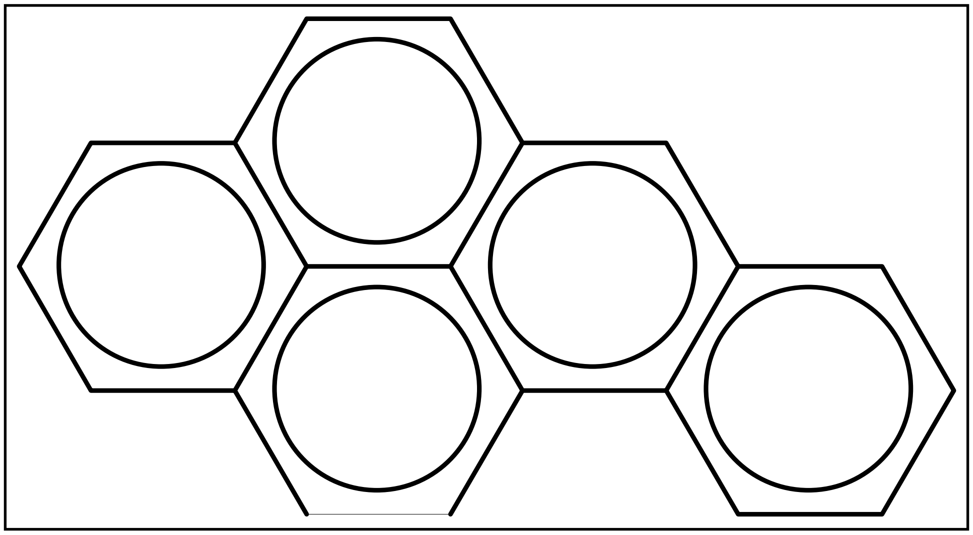

Figure 5. Aromatic structure of benzo[a]pyrene.

Like all PAHs, BaP is seldom of concern for acute exposure. The toxicological problem consists of the chronic effects of long-term exposure to metabolic products. Specifically, the cytochrome P450 system produces the ultimate carcinogen (+)-7R,8S-dihydroxy-9S,10R-epoxy-7,8,9,10-tetrahydro-benzo[a]pyrene (Chang et al. 2006). This product intercalates with DNA and causes errors in transcription (Kang and Lee 2005).

Due to the hydrophobicity of BaP (log $K_{OW}$ > 6), very little is ever present in water. The EPA Region 6 water quality criterion MCL for BaP is 0.20 μg/L. BaP preferentially binds to the organic carbon in solids such as sediments. The EPA Region 6 residential soil screening level for BaP is 62 μg/kg. The applicable LADEQ criterion is 0.33 μg/g.

## BaP New Orleans data

Mielke et al. (2001) found that pre-Katrina levels of BaP in New Orleans city soil ranged from 52 to 6102 μg/kg, and found, in agreement with other studies, that PAHs in runoff sediments were higher than in the soils. In this context the flooded city of New Orleans acted as a BaP source to the local environment as the water was pumped out of the city.

Because the levees failed in multiple areas, all three polders were deeply flooded at about the same time with brackish storm surge water, Lake Pontchartrain water, and Mississippi River water. The depth of flooding can be envisioned from the U.S. Army Corps of Engineers map from the New Orleans District (Figure 6) and was up to 20 ft in isolated spots. The

floodwater remained for weeks. The three polders behind their levees, after they were patched, became three separate contaminant sources for nearby ecosystems. New Orleans proper and New Orleans East were pumped into Lake Pontchartrain, and the Lower Ninth Ward and Chalmette area were pumped into Violet Marsh. Some of the sediment was entrained and pumped out with the water, and more was flushed out with other runoff.

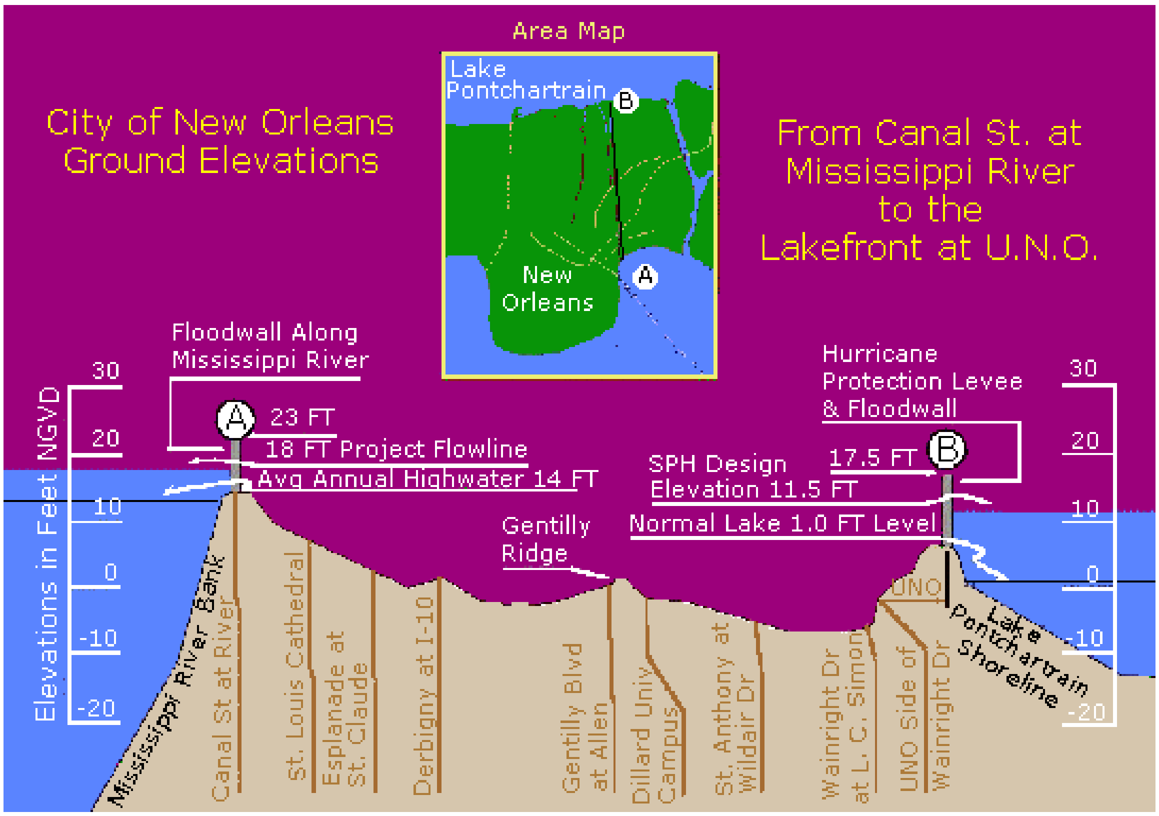


Figure 6. Cross section of New Orleans proper showing elevations.

It is thought the storm surge up the Mississippi River Gulf Outlet (MRGO) and the elevated lake levels provided the hydrological force for most of the levee breaches. The subsided New Orleans area quickly flooded. Many of the details of the flooding and flows have been modeled in Corps of Engineers reports.

Some of the major sources of contamination in New Orleans proper included the contaminated urban soil and structures (Mielke et al. 2004). The flooded New Orleans East area is heavily industrialized. In Chalmette at least one entire oil storage tank at the Murphy Oil Corporation site was breached and completely failed, and the entire site was flooded. Near the

Lower Ninth Ward, over the Bayou Bienvenue levee, the main New Orleans area sewage treatment plant was flooded, damaged, and inoperable for weeks. The Corps of Engineers began to pump out the floodwater, and the final floodwater was declared pumped out on October 11, 2005. This floodwater provided a nearly steady-state source of contamination to nearby ecosystems. The hydrological flows and transport processes of the pumping out are treated in detail in Dortch et al. (2006).

The EPA and the LADEQ conducted extensive measurement operations throughout the flooded urbanized New Orleans area from September through December 2005. Louisiana State University (Pardue et al. 2005) and Texas Tech University (Presley et al. 2006) led independent sampling expeditions in flooded New Orleans, principally in limited parts of New Orleans proper. They reported on a greater variety of contaminants over a more limited area than the EPA data. The data sources used in this report are summarized in Table 1.

Table 1. Sources of information used for chemical microbiological analyses.

| | Pre-Katrina | Actual Post-Katrina |
|---|---|---|
| Urban Region (Inner) | | |
| Infectious | Inferred and anecdotal<br>Fecal sterols–core bottoms | EPA database<br>Tot. Colif.–core tops<br>Fec. Colif.–core tops<br>Fec. Strep.–core tops<br>Fecal sterols–core tops |
| Chemical | Mielke 1999<br>BaP from core bottoms | EPA database<br>BaP–core tops |
| Violet Marsh Region (Nearby) | | |
| Infectious | Fecal sterols–core bottoms | Tot. Colif.–core tops<br>Fec. Colif.–core tops<br>Fec. Strep.–core tops<br>Fecal sterols–core tops |
| Chemical | BaP from core bottoms | BaP–core tops |
| Lake Pontchartrain Region (Nearby) | | |
| Infectious | LPBF–coliform | LPBF–coliform |
| Chemical | LPBF–WQ data | LPBF–WQ data |

# 2 Experimental Methods

## ERDC sediment sampling

As part of the Environmental Subtask, the ERDC conducted a sampling trip 14-16 February 2006 to Violet Marsh outside the polder of the Lower Ninth Ward and the Chalmette area, using an airboat to access the marsh. The ERDC metals fabrication shop modified a commercially available stainless steel (SS) soil coring device for the purpose of retrieving undisturbed sediment cores from wetlands (Figure 7). The SS coring device consisted of three SS parts: the main part was the cylindrical coring tube with dimensions of 4.25 in. outside diameter (o.d.) and 4.00 in. inside diameter (i.d.), and 11.625 in. length. Attached to the bottom of the coring tube was a fitted, lock-in-place, stainless steel ring with protruding cutting teeth with dimensions of 4.25 in. o.d., 4.00 in. i.d., and 1.5 in. length. This piece acted both as the cutting part of the tube and as the securing ring for holding an autoclaved acrylic coring sleeve in place within the SS coring tube. The third component of the coring tube was an SS disk that measured 0.35 in. in thickness and 3.87 in. in diameter and rested on top of the acrylic core sleeve within the coring tube. This disk was held in place by two screws set into the rim of the top of the coring tube that protruded approx 0.125 in. into the interior of the coring tube.

Figure 7. Sediment coring device.

The coring tube was gently pushed down into the sediment over the course of a minute using the ratcheting “T-bar” handle. The teeth cut in the direction of ratcheting. The coring continued until the sediment reached the disk, and then the coring tube was brought up into the airboat, or up onto dry land where the cutting ring was removed and the acrylic core containing the sample was allowed to slide partway out of the coring tube (Figure 8). Immediately a plastic cap was secured onto the bottom of the acrylic core sleeve to cover and protect the core sample material inside. Once the bottom cap was secure, the acrylic core sleeve was allowed to

slide fully out of the SS coring tube and was set upright on a flat surface. The SS disk was then removed from the top of the acrylic core sleeve where it had acted as a temporary cap to prevent the loss of material, and a second plastic cap was placed on top of the core sleeve to enclose the sediment sample. The secured sample was then placed on ice in a cooler and transported to ERDC after all samples had been collected.

Figure 8. ERDC team in Violet Marsh.

The coring tube, cutting ring, and SS disk were then scrubbed in water with a brush to free them of any remaining sediment, and the insides and outsides were sprayed with a 99 percent Isopropyl alcohol solution for disinfection and allowed to air dry for a minute after there was no visible liquid alcohol residue. Then a fresh autoclaved acrylic sleeve was placed into the interior of the coring tube, the SS disk was positioned on top of the sleeve within the inside of the coring tube, and the cutting ring was secured to the bottom of the coring tube in preparation for the next core sample to be taken.

In the ERDC Environmental Microbiology laboratory, ice-cold cores were placed in chemical fume hoods and the top caps were removed from the acrylic cores. The first 5 cm were aseptically removed from the top of each core (Figure 9) and thoroughly mixed with a sterile spatula. Separately the lowest 5 cm were aseptically removed from the bottom of each core and

mixed. Portions of this homogenized sediment were frozen and aliquots set aside for the various physical, chemical and microbiological analyses. Dry weights were determined by drying an aliquot in the hood in ambient air for a day.


Figure 9. Removing and weighing sediment.

## Bacterial indicators of pathogens in sewage

Microbiological analyses for total coliform (SM 9222-D), fecal coliform (SM 9222-D) and fecal streptococci (SM 9230-C) were performed on sediment samples using standard microbiological methods (Standard Methods for the Examination of Water and Wastewater 2005).

## Benzo[a]pyrene and fecal sterol analyses

Fecal sterols and polycyclic aromatic hydrocarbons were extracted from sediment samples using the methods described in Ringelberg et al. (2001). All glassware was solvent washed and treated in a muffle furnace before use. Sterol standards were purchased from Sigma-Aldrich Corporation (coprostanol, 5ß-cholestan-3ß-ol; epicoprostanol, 5ß-cholestan-3α-ol; ß-sitosterol, 24-ethylcholest-5-en-3ß-ol; stigmastanol, 24-ethyl-5α-cholestan-3ß-ol) and Applied Science Labs, State College, PA (coprostanone, 5ß-cholestanone; cholesterol, cholest-5-en-3ß-ol; campesterol, 24-methylcholest-5-en-3ß-ol). An 11-g aliquot (wet weight) of sediment was weighed out, and a known amount of deuterated pyrene was mixed into the wet sediment to serve as a recovery standard. A mixture of dichloromethane:methanol:water (1:2:0.8, v:v:v) was added to the sample. The sediment sample was then extracted for 1 hr in an ultrasonic water bath at 10 °C, and then allowed to stand overnight. Equal volumes of dichloromethane (DCM) and water were added to break the liquid phases and the entire volume was centrifuged at 5000 rpm for 10 minutes. The

DCM phase containing the total extractable lipids was recovered using a glass pipette. The DCM was reduced in volume under a stream of dry nitrogen to approximately 100 μL and then brought to a final volume of 2 mL with clean DCM. A subsample (100 μL) of this total lipid extract was derivatized using trimethylchlorosilane for fecal sterol analysis.

Fecal sterols and BaP by GC/MS were determined using slight modifications to the standard method proposed by the Florida Department of Natural Resource Protection (1998). After TMS derivatization, fecal sterol samples were analyzed using a gas chromatograph equipped with a 60 m × 0.25 mm (ID) DB-5MS capillary column (0.1 μm film thickness, J&W Scientific, Folsom, CA) and a Mass Selective Detector (Hewlett Packard GC6890-5973). Peak identities were confirmed by comparing retention times and fragment ion masses (with electron impact ionization at 70 eV) to standards and the NIST MS database. Areas under the peaks were converted to concentrations, corrected to the efficiency of recovery of the deuterated pyrene and then normalized to the gram dry weight of the wet aliquot extracted. Ion mass patterns were used to confirm the identities of the benzo[a]pyrene and sterol GC peaks.

The recovery efficiency of the deuterated pyrene was very consistent and low (~30 percent). All BaP and fecal sterols levels were corrected to each sample's deuterated pyrene recovery. The lower limit for quantization (LLQ) of BaP was determined by adding an extra 0.1 μg/gdw of BaP to three different sediment samples. The LLQ was measured as three times the standard deviation of these matrix spikes. The lower limit of detection (LLD) was determined as three times the standard deviation of the noise in blanks. The BaP LLQ for these samples and this analysis system was 0.067 μg/gdw and the LLD was 0.009 μg/gdw. Both the LLQ and LLD for the fecal sterols were 0.1 nmol/gdw.

# 3 Results

## Mining the EPA/LADEQ data

The microbiological raw data downloaded from EPA's STORET Katrina Central Data Warehouse (http://oaspub.epa.gov/storetkp/dw) for Orleans and St. Bernard Parishes are summarized in Appendix A. These data included 139 water and 569 sediment sampling results in Orleans and St. Bernard Parishes, with sampling dates from 10 September 2005 to 20 November 2005. Some of the samples were taken outside the polder areas. Values were reported as non-detects or present non-quantitated for 19 water and 406 sediment samples in the polders. Several analytical procedures were reportedly used. The sample quantitation limits (SQL) were not reported. The sediment fecal coliform units were erroneously reported in cfu per 100 mL, as for water, instead of the correct cfu/g (USEPA 2004b).

All of the EPA/LADEQ Katrina floodwater and sediment sampling sites in Orleans and St. Bernard Parishes are marked in Figure 10 by green stars. This figure was produced by EPA's EnviroMapper utility.

These sampling points were distributed among three main drainage areas or polders, as defined by the system of levees radiating from the turning basin in the Inner Harbor Navigation Canal, illustrated in Figure 11. New Orleans proper was considered to be that portion of Orleans Parish west of the IHNC, while New Orleans East was the urbanized area of Orleans Parish east of the IHNC and north of the Intracoastal Waterway leading to the Mississippi River Gulf Outlet. The urbanized areas east of the IHNC and south of the Intracoastal Waterway were primarily the Lower Ninth Ward of Orleans Parish and the Chalmette area of St. Bernard Parish. The EPA/LADEQ sampling points that correspond to each polder are given in Appendix B.

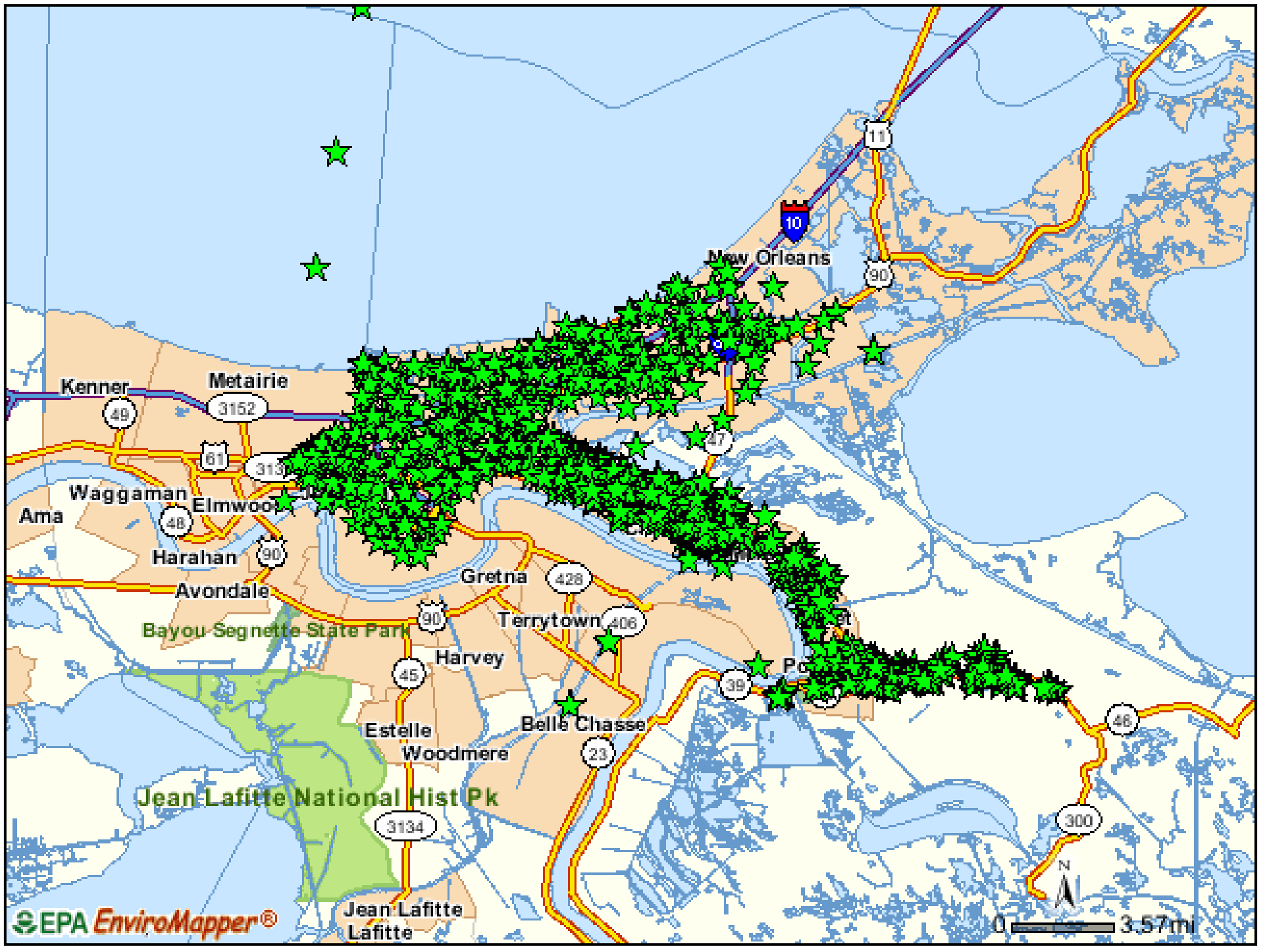


Figure 10. Locations of EPA samples in Orleans and St. Bernard Parishes.

## EPA/LADEQ summary statistics

EPA/LADEQ water fecal coliform counts (colony forming units per 100 mL of water) ranged from non-detect to 490,000 (mean 21,381, median 2,200, standard deviation 74,541) in New Orleans proper, non-detect to 30,000 (mean 3,308, median 200, SD 8,093) in New Orleans East, and non-detect to 25,000 (mean 1,287, median 100, SD 4,381) in St. Bernard and the Lower Ninth Ward polders. EPA/LADEQ sediment fecal coliform (cfu per gram dry weight of sediment) ranged from non-detect to 996,260 (mean 31,645, median non-detect, SD 116,783) in New Orleans proper, non-detect to 416,250 (mean 9,980, median non-detect, SD 47,327) in New Orleans East, and non-detect to 1,115,800 (mean 30,196, median non-detect, SD 119,808) in St. Bernard and the Lower Ninth Ward polders. Different values in the polders could be described statistically.

EPA's STORET Katrina Central Data Warehouse yielded 295 floodwater measurements of BaP, with 294 non-detects. The sole detect was 0.42 μg/L. The 1,110 sediment samples tested for BaP ranged from non-detect to 35,500 μg/kg, with 894 non-detects (152 samples exceed the EPA screening standard). The flood sediment in all three polders frequently exceeded the standard. Further analyses of the chemical contaminants in the EPA/LADEQ database are presented in Bowley et al. (2006).

## Statistical distribution parameter estimation

For randomly diluted samples a lognormal distribution was expected, in the same way that a normal distribution was expected for randomly additive samples. To develop a lognormal fit to the data, the natural logarithm of each data point, plus an irrelevant small constant offset if there were to be zero or negative data, was calculated and these logarithms were binned. The size of the bins was judiciously chosen to have sufficient data points as well as sufficient resolution. The resulting histogram of the logarithms was then fit by a Gaussian curve. The parameters for curve height, width, and location (and offset) were chosen by a global least squares minimization for goodness of fit.

As illustrated in Figure 11 for sediments, the data without the non-detects was indeed roughly lognormal ($r^2 = 0.70$). For a lognormal distribution, the 95-percent UCL is defined (EPA 1992) as

$$\text{95-percent UCL} \equiv e^{\left(\frac{s^2}{2}+l+\frac{h \cdot s}{\sqrt{n-1}}\right)}$$

where n is the number of data points, *l* is the average of the logarithms of the data (with offset), s is the standard deviation of the logarithms, and h is Land's h statistic. Tables of the h statistic have been compiled (Gilbert 1987) and values are also available through commercial software packages.

For further analyses and inclusion into a lognormal distribution, the non-detects cannot be taken to be zero, and in practice were assumed to be, on average, half the SQL (USEPA 1992). As seen in Figure 11 for the sediments, the large number of non-detects cause another histogram peak at half the SQL. This bimodal distribution could not in general be well fit by any unimodal distribution such as the lognormal, and thus the calculations of distribution-based parameters such as the 95 percent UCL were much less meaningful for the bimodality reflected in the data. Even simpler

parameters such as mode, standard deviation, and median are much less useful in describing nonunimodal distributions.

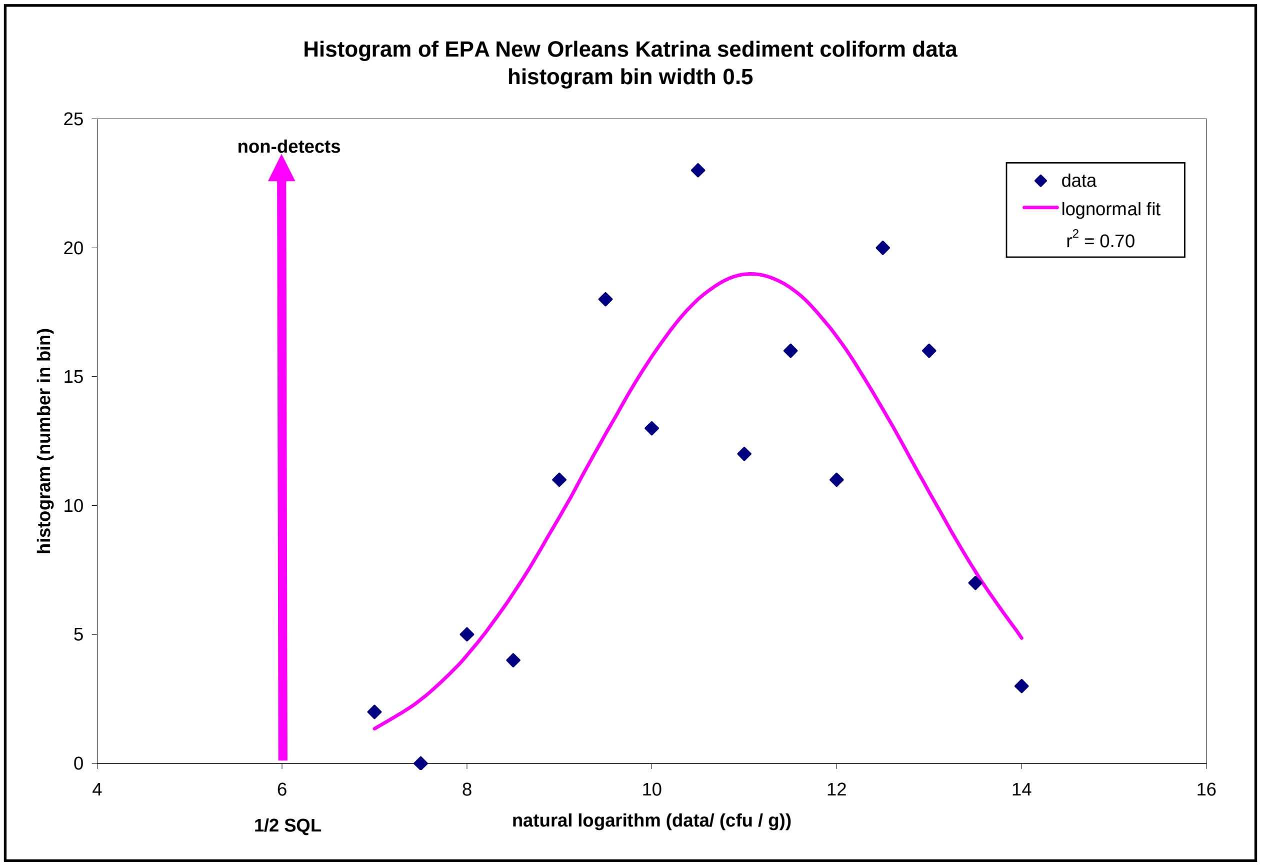


Figure 11. Bimodal histogram of EPA Katrina sediment data.

## Temporal trend analyses

No trend (neither increasing nor decreasing) was evident with time for the EPA/LADEQ microbiological water data as the floodwater was pumped out and then after flood pumping ceased on October 11. As seen in Figure 12, the fecal coliform data were uncorrelated ($r^2 = 0.012$) with time. The data in neither of the other polders were correlated with time. In particular they did not decrease.

The half lives of fecal coliform in New Orleans surface waters are of the order of a couple of days at most (Davies et al. 1995). Thus, no decrease in fecal coliform suggested that the post-flood sewage system was not properly operational throughout the time the data were collected. Many of the data frequently exceeded the primary recreational water standard of 400 cfu/100 mL; 53 of the 139 data points exceeded the standard.

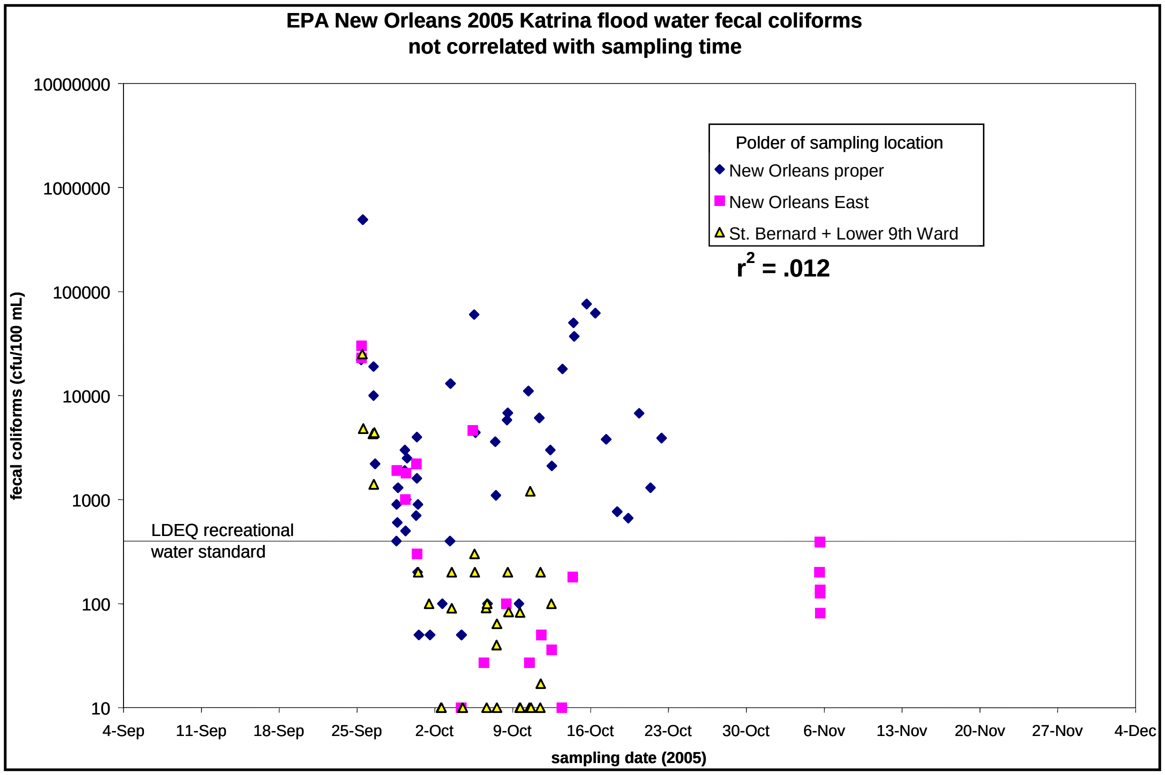


Figure 12. EPA New Orleans 2005 Katrina floodwater fecal coliforms vs sampling time.

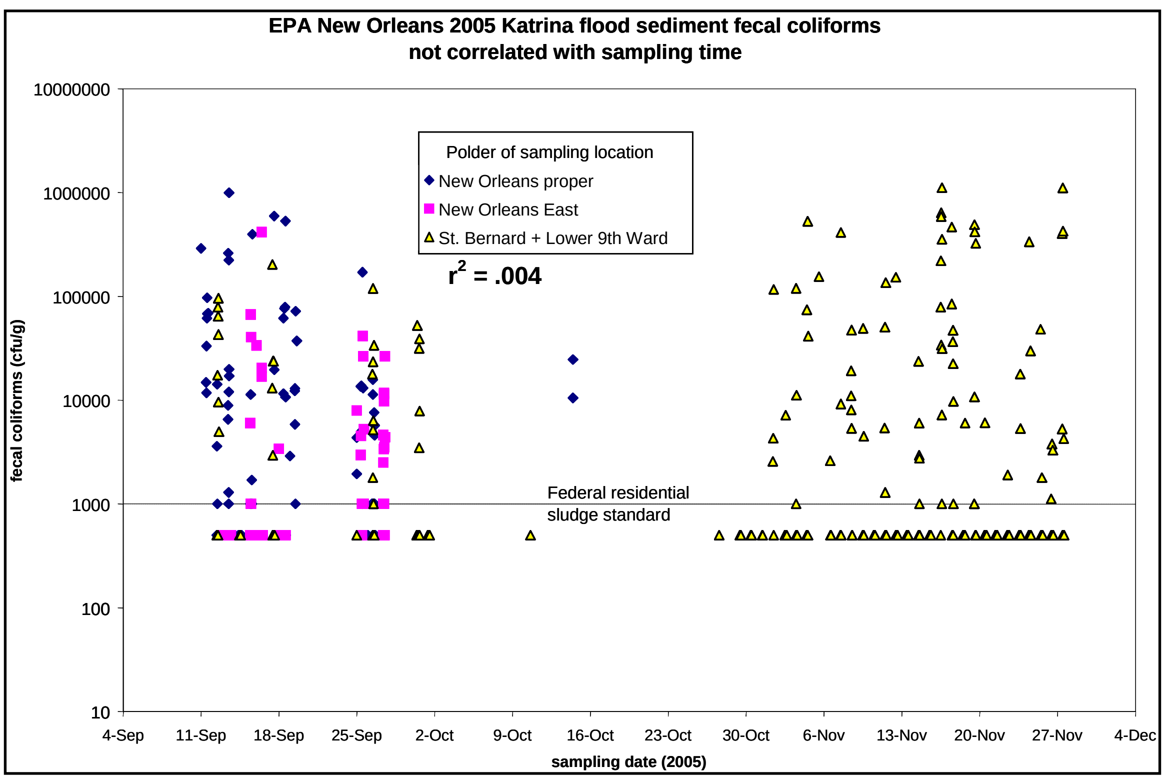


Figure 13. EPA New Orleans 2005 Katrina sediment fecal coliforms vs sampling time.

Similarly, no trend (neither increasing nor decreasing) was evident with time for the EPA/LADEQ microbiological sediment data as the floodwater was pumped out and then after flood pumping ceased on October 11. As seen in Figure 13, the fecal coliform data were uncorrelated ($r^2 = 0.004$) with time. The data in neither of the other polders were correlated with time. In particular they did not decrease.

The half lives of fecal coliform in New Orleans surface sediments are of the order of a couple of weeks at most (Burton et al. 1987). Thus, no decrease in fecal coliform suggests that the post-flood sewage system was not properly operational throughout the time the data were collected. Many of the data again frequently exceeded the federal residential biosolids standard of 1000 cfu/g; this standard was exceeded by 162 of the 569 EPA Katrina sediment samples from Orleans and St. Bernard Parishes.

## Data reduction for environmental modeling

As part of the microbiological data mining products, suggested values and statistics were provided to the environmental modeling team. The lack of a temporal trend meant that single characteristic values could be used for the entire modeled time. The selected statistics were the medians and the 95 percent UCL as presented in Table 2.

Table 2. Microbiological values for environmental modeling.

| All values in cfu/100 mL | New Orleans Proper | New Orleans East | St. Bernard + Lower 9th Ward |
|---|---|---|---|
| Sediment median, neglecting nondetects | 14,200 | 9,700 | 23,800 |
| Sediment median, 1/2 SQL = 500 | 500 | 500 | 500 |
| Sediment 95% UCL, neglecting nondetects | 164,000 | 55,000 | 244,000 |
| Sediment 95% UCL, 1/2 SQL = 500 | 87,000 | 7,200 | 334,000 |
| Water median, neglecting nondetects | 3,600 | 200 | 200 |
| Water median, 1/2 SQL = 50 | 2,200 | 200 | 100 |
| Water 95% UCL, neglecting nondetects | 41,000 | 43,000 | 7,200 |
| Water 95% UCL, 1/2 SQL = 50 | 70,000 | 33,000 | 1,700 |

## ERDC sediment core locations

Sediment core sample locations were selected to capture potentially major primary contaminant sources located at Murphy Oil Corporation, and the municipal sewage treatment plant. Some samples were collected as close

to these sources as possible. Canals drain the Murphy Oil property and conduct water to the large stationary pumps that pumped the water over the levees. Core samples were collected from both the immediate influent and immediate effluent of the pumps that could have transported contaminants from these two sources into Violet Marsh. Sediment core samples were also collected at various distances from these pumps out into Violet Marsh to determine the range of transport of these contaminants into the marsh. All locations from which ERDC collected core samples are shown as yellow circles in Figures 14 and 15 and the GPS coordinates of these sites are given in Table 3. Almost all of the ERDC sites are outside the inner urban levees. A few of the nearby EPA sampling sites are shown in red circles for visual comparison. Almost all the EPA sites are inside of the inner urban levees.

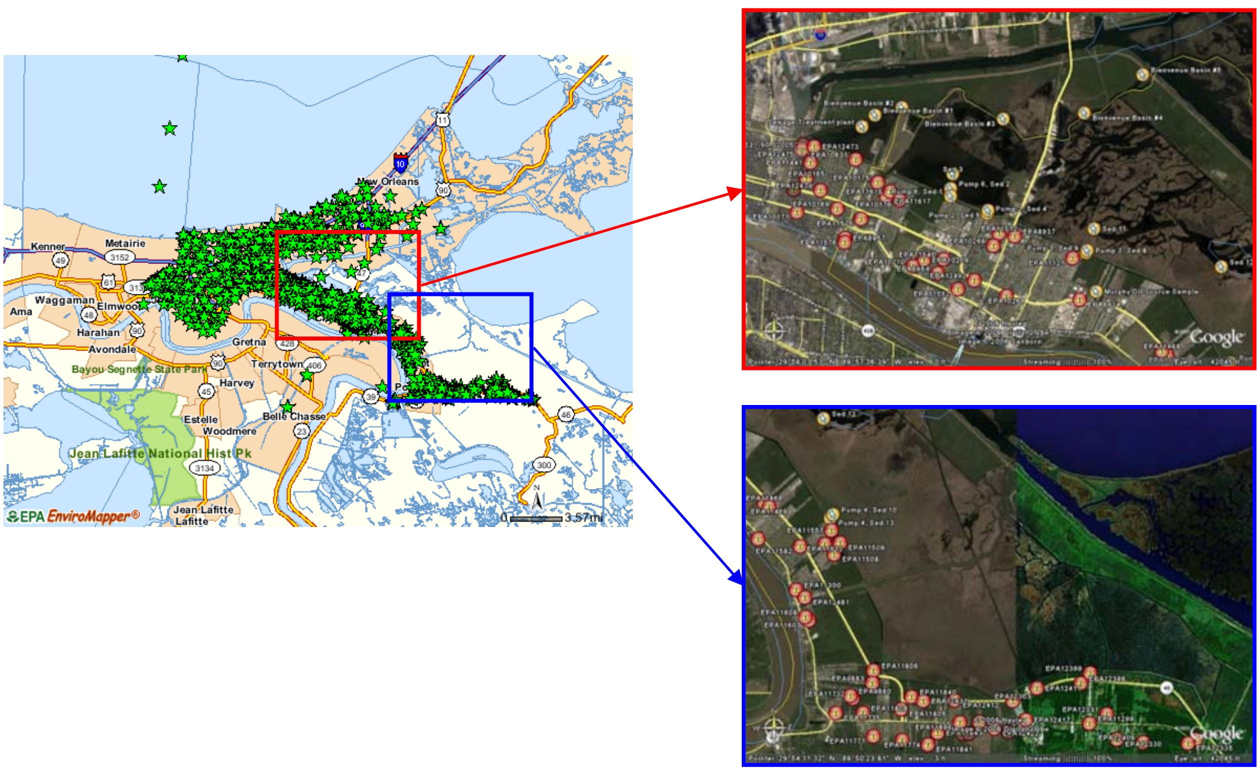


Figure 14. Locations of ERDC core samples and relation to EPA samples.


Figure 15. ERDC locations at a higher resolution.

Table 3. ERDC sampling locations descriptions.

| Sample Name | Latitude | Longitude | Description |
|---|---|---|---|
| Sewage Plant | 29.984166 | -90.001866 | Northwest of treatment plant in marsh |
| Murphy Oil Site | 29.940866 | -89.931083 | Munster Ln, North of Judge Perez, intersection of drainage canal running N.W. |
| Pump 2 Sed 4 | 29.961400 | -89.963983 | Before pump #2 |
| Pump 2 Sed 5 | 29.962183 | -89.963783 | After pump #2 |
| Pump 3 Sed 8 | 29.951633 | -89.933833 | After pump #3 |
| Pump 3 Sed 9 | 29.951050 | -89.934100 | Before pump #3 |
| Pump 4 Sed 10 | 29.922100 | -89.890416 | After pump #4 |
| Pump 4 Sed 13 | 29.921133 | -89.891266 | Before pump #4 |
| Pump 6 Sed 1 | 29.965925 | -89.975072 | Before pump #6 |
| Pump 6 Sed 2 | 29.967916 | -89.975088 | After pump #6 |
| Sed 3 | 29.971766 | -89.974433 | Due north of pump #6, middle of marsh |
| Sed 11 | 29.957350 | -89.931783 | NNE of pump #3, middle of marsh |
| Sed 12 | 29.947333 | -89.893266 | Due north of pump #4 middle of marsh |
| Bienvenue Basin 1 | 29.987200 | -89.997950 | adjacent to treatment plant areator within discharge canal |
| Bienvenue Basin 2 | 29.989166 | -89.989816 | beginning of treatment plant discharge canal |
| Bienvenue Basin 3 | 29.986166 | -89.959183 | towards the end of treatment plant discharge canal |
| Bienvenue Basin 4 | 29.987733 | -89.934683 | north shore of marsh between discharge canal and intracoastal waterway lock |
| Bienvenue Basin 5 | 29.997783 | -89.917000 | adjacent to intracoastal waterway canal lock |

## Fecal bacteria indicator culture data

Sediment cores were transported back to the Vicksburg laboratory on ice and samples were taken from the top 5 cm of each core as previously described. Samples were analyzed using the Standard Methods Most Probable Number Analyses for total coliform, fecal coliform and fecal

streptococci (Table 4). Samples from the bottoms of these cores were not analyzed because these fecal bacteria were not thought to be able to survive for extended periods of time in sediments. Fecal streptococci are the indicators currently recommended by the EPA for estuarine and marine systems, but no sediment quality standards were currently recommended. Only one fecal strep sample from the top of the Murphy Oil drainage canal produced a reading that was above the lower detection limit of the analysis. In contrast, all the total coliform analyses except those from the two outermost samples of Bayou Bienvenue produced moderate to high counts. The highest coliform values were not at the sewage treatment plant outfall but from the Murphy Oil drainage canal and locations indicating input from Chalmette into Violet Marsh. Fecal coliform counts exceeded the standard for biosolids set by 40 CFR 503 (1000 cfu/gdw) for all sample locations except the sewage treatment plant and all samples from the Bayou Bienvenue. The reason for relatively low total and fecal coliform bacteria in these locations was not clear but may be biological (i.e. not just due to housing location or dilution) via inhibition of bacterial growth by co-occurring chemical contaminants and/or active coliphage (not measured) activity in these chronically polluted areas.

## Fecal sterol data

Coprostanol levels in the tops and bottoms of almost all cores collected indicated significant historic and recent fecal impacts on Violet Marsh (Table 5). These levels are comparable to those in heavily sewage-impacted marshes in Barcelona, Spain and Havana, Cuba (Table 6). Analysis of the sterol content from the bottom of the cores provided some insights into the input of fecal matter into Violet Marsh before Katrina struck (Table 5). In these earlier deposited sediments, the levels of coprostanol were highest in the two most western sampling stations in the Bayou Bienvenue; BB1 (61.2 nmol/gdw) and BB2 (87.8 nmol/gdw). Coprostanol levels rapidly decreased with distance to the east (BB3-5; 3.4-6.0 nmol/gdw). Together, these data suggested the sewage treatment plant (or other source in this area) constituted a major long-term source of fecal contamination but the distribution of this fecal material into Violet Marsh was rather limited. High to moderate levels of coprostanol were found in the bottom of the core taken closest to the sewage plant outfall (20.3 nmol/gdw) and pump stations #2 (32.8 nmol/gdw), #3 (12.6 nmol/gdw) and #6 (8.0 nmol/gdw), indicating a long-term source of fecal contamination from these sources. It is important to note that almost all of the sediments analyzed exceeded the

most lenient coprostanol sediment quality standard suggested (1 nmol/gdw), indicating that Violet Marsh has been chronically impacted by fecal material.

Table 4. Fecal indicator bacteria levels in Violet Marsh sediments.

| Table | Plate count results from Top of Soil Core | | | | |
|---|---|---|---|---|---|
| | | Total | Fecal | Fecal | 40 CFR 503 |
| Sample | | Coliforms | Coliforms | Streptococci | BioSolid Res Std FecColif |
| Location | | CFU/gm | CFU/gm | CFU/gm | 1000 |
| | | | | | |
| Bienvenue Basin 1 | TOP | 17,000 | < 1,000 | <1,000 | – |
| Bienvenue Basin 2 | TOP | 12,000 | < 1,000 | <1,000 | – |
| Bienvenue Basin 3 | TOP | <1000 | < 1,000 | <1,000 | – |
| Bienvenue Basin 4 | TOP | <1000 | < 1,000 | <1,000 | – |
| Bienvenue Basin 5 | TOP | 3,000 | < 1,000 | <1,000 | – |
| Sewage Plant | TOP | 10,000 | < 1,000 | <1,000 | – |
| Murphy Oil Site | TOP | 1,600,000 | 630,000 | 100 | > |
| Pump 2 Sed 4 | TOP | 57,000 | 14,000 | <100 | > |
| Pump 2 Sed 5 | TOP | 133,000 | 25,000 | <100 | > |
| Pump 3 Sed 8 | TOP | 84,000 | 5,000 | <100 | > |
| Pump 3 Sed 9 | TOP | 630,000 | 70,000 | <100 | > |
| Pump 4 Sed 10 | TOP | 77,000 | 10,000 | <100 | > |
| Pump 4 Sed 13 | TOP | 128,000 | 15,000 | <100 | > |
| Pump 6 Sed 1 | TOP | 30,000 | 8,000 | <100 | > |
| Pump 6 Sed 2 | TOP | 65,000 | 2,000 | <100 | > |
| Sed 11 | TOP | 33,000 | 3,000 | <100 | > |
| Sed 12 | TOP | >200000 | 4,000 | <1,000 | > |
| Sed 3 | TOP | 2,100 | 3,000 | <100 | > |
| Mean | | 192,073 | 65,750 | | |
| Standard Deviation | | 419,233 | 178,681 | | |
| Median | | 57,000 | 9,000 | | |

The coprostanol levels in sediment from the top of the cores also showed significant impacts from fecal contamination (Table 5). The average level of coprostanol in the most recent sediment was higher (20.2 nmol/gdw) than that of the bottom sediment (16.9 nmol/gdw), which suggested increasing fecal input. Additionally, the relative coprostanol distribution pattern in the most recent sediments was different from that observed from the analysis of core bottoms. The levels of coprostanol in the surface sediments of the eastern location in the Bayou Bienvenue (BB1= 28.3 nmol/gdw; BB2=28.5 nmol/gdw) were approximately half of those found in the sediments of the bottoms of these cores. This may reflect the lack of input due to the failure of the sewage treatment system that resulted from the flooding. In contrast, the surface sediments associated with pump stations #2, #3, #4 and #6 all contained higher levels of coprostanol than their respective core bottoms. This suggested that the

flooding resulted in a greater fecal load to Violet Marsh than originated from Chalmette along the northern levee.

Table 5. Fecal sterol levels in Violet Marsh sediments.

| Table X. Fecal sterol content of sediment from the tops and bottoms of cores. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | Ratio | Ratio | Ratio | Ratio |
| Sample | | coprostanol | epicoprostanol | cholesterol | cholestanol | A/D | B/A | A/C | A/A+D |
| Location | | nmol/gm dw | nmol/gm dw | nmol/gm dw | nmol/gm dw | | | | |
| | | | | | | | | | |
| Bienvenue Basin 1 | Top | 28.3 | 1.6 | 43.5 | 3.8 | 7.37 | 0.06 | 0.65 | 0.88 |
| Bienvenue Basin 2 | Top | 28.5 | 41.4 | 355.2 | 41.0 | 0.70 | 1.45 | 0.08 | 0.41 |
| Bienvenue Basin 3 | Top | 9.2 | 0.8 | 43.6 | 7.9 | 1.16 | 0.08 | 0.21 | 0.54 |
| Bienvenue Basin 4 | Top | 9.1 | 2.6 | 42.7 | 5.0 | 1.81 | 0.29 | 0.21 | 0.64 |
| Bienvenue Basin 5 | Top | 4.2 | 0.4 | 110.9 | 5.1 | 0.82 | 0.10 | 0.04 | 0.45 |
| Sewage Plant | Top | 27.3 | 18.1 | 29.2 | 6.5 | 4.20 | 0.66 | 0.93 | 0.81 |
| Murphy Oil Site | Top | 20.8 | 0.6 | 17.2 | 1.3 | 15.58 | 0.03 | 1.21 | 0.94 |
| Pump 2 Sed 4 | Top | 3.0 | 3.7 | 67.7 | 3.8 | 0.79 | 1.24 | 0.04 | 0.44 |
| Pump 2 Sed 5 | Top | 61.3 | 4.6 | 344.7 | 30.3 | 2.02 | 0.07 | 0.18 | 0.67 |
| Pump 3 Sed 8 | Top | 20.6 | 1.8 | 145.8 | 10.0 | 2.06 | 0.09 | 0.14 | 0.67 |
| Pump 3 Sed 9 | Top | 39.1 | 2.2 | 90.0 | 9.1 | 4.31 | 0.06 | 0.44 | 0.81 |
| Pump 4 Sed 10 | Top | 28.1 | 2.0 | 32.4 | 5.9 | 4.72 | 0.07 | 0.87 | 0.83 |
| Pump 4 Sed 13 | Top | 13.4 | 1.0 | 68.6 | 6.3 | 2.11 | 0.08 | 0.20 | 0.68 |
| Pump 6 Sed 1 | Top | 22.0 | 1.7 | 117.4 | 10.5 | 2.09 | 0.08 | 0.19 | 0.68 |
| Pump 6 Sed 2 | Top | 9.5 | 0.8 | 44.3 | 6.8 | 1.39 | 0.08 | 0.21 | 0.58 |
| Sed 11 | Top | 21.5 | 6.0 | 90.3 | 7.0 | 3.06 | 0.28 | 0.24 | 0.75 |
| Sed 12 | Top | 4.3 | 0.7 | 40.6 | 7.3 | 0.58 | 0.17 | 0.10 | 0.37 |
| Sed 3 | Top | 14.3 | 1.1 | 67.5 | 11.0 | 1.31 | 0.07 | 0.21 | 0.57 |
| Mean | | 20.2 | 5.1 | 97.3 | 9.9 | 3.1 | 0.3 | 0.3 | 0.7 |
| Standard Deviation | | 14.4 | 10.0 | 98.0 | 9.8 | 3.6 | 0.4 | 0.3 | 0.2 |
| Median | | 20.7 | 1.8 | 67.6 | 6.9 | 2.0 | 0.1 | 0.2 | 0.7 |
| | | | | | | | | | |
| Bienvenue Basin 1 | Bottom | 61.2 | 2.5 | 80.2 | 6.5 | 9.38 | 0.04 | 0.76 | 0.90 |
| Bienvenue Basin 2 | Bottom | 87.8 | 4.6 | 115.4 | 11.3 | 7.78 | 0.05 | 0.76 | 0.89 |
| Bienvenue Basin 3 | Bottom | 3.4 | 0.5 | 23.4 | 3.0 | 1.15 | 0.14 | 0.15 | 0.53 |
| Bienvenue Basin 4 | Bottom | 6.0 | 0.5 | 33.2 | 7.0 | 0.86 | 0.09 | 0.18 | 0.46 |
| Bienvenue Basin 5 | Bottom | 3.4 | 0.5 | 22.0 | 5.0 | 0.68 | 0.14 | 0.15 | 0.40 |
| Sewage Plant | Bottom | 20.3 | 2.7 | 91.8 | 19.8 | 1.02 | 0.13 | 0.22 | 0.51 |
| Murphy Oil Site | Bottom | 23.9 | 1.2 | 15.3 | 4.6 | 5.18 | 0.05 | 1.56 | 0.84 |
| Pump 2 Sed 4 | Bottom | 8.1 | 0.7 | 84.5 | 4.8 | 1.67 | 0.09 | 0.10 | 0.63 |
| Pump 2 Sed 5 | Bottom | 32.8 | 3.2 | 99.2 | 19.1 | 1.72 | 0.10 | 0.33 | 0.63 |
| Pump 3 Sed 8 | Bottom | 0.9 | 0.1 | 4.9 | 0.4 | 2.16 | 0.08 | 0.19 | 0.68 |
| Pump 3 Sed 9 | Bottom | 12.6 | 0.5 | 20.3 | 5.1 | 2.50 | 0.04 | 0.62 | 0.71 |
| Pump 4 Sed 10 | Bottom | 0.0 | 0.0 | 2.7 | 0.9 | 0.00 | - | 0.00 | 0.00 |
| Pump 4 Sed 13 | Bottom | 0.0 | 0.0 | 2.1 | 0.4 | 0.00 | - | 0.00 | 0.00 |
| Pump 6 Sed 1 | Bottom | 5.0 | 0.5 | 24.0 | 3.5 | 1.41 | 0.10 | 0.21 | 0.59 |
| Pump 6 Sed 2 | Bottom | 8.0 | 1.1 | 56.5 | 10.0 | 0.79 | 0.13 | 0.14 | 0.44 |
| Sed 11 | Bottom | 14.2 | 1.4 | 84.5 | 12.3 | 1.15 | 0.10 | 0.17 | 0.54 |
| Sed 12 | Bottom | 6.0 | 1.3 | 55.6 | 9.8 | 0.61 | 0.22 | 0.11 | 0.38 |
| Sed 3 | Bottom | 11.2 | 1.1 | 63.3 | 18.4 | 0.61 | 0.10 | 0.18 | 0.38 |
| Mean | | 16.9 | 1.2 | 48.8 | 7.9 | 2.1 | 0.1 | 0.3 | 0.5 |
| Standard Deviation | | 23.1 | 1.2 | 36.8 | 6.2 | 2.6 | 0.0 | 0.4 | 0.3 |
| Median | | 8.0 | 0.9 | 44.4 | 5.8 | 1.2 | 0.1 | 0.2 | 0.5 |

Ratios of the levels of various other sterols recovered from wetland sediment cores have been used as aids to data interpretation, particularly in highly productive systems where coprostanol levels were below 2 nmol/gdw and other sources of sterols had become significant. None of these sterol ratios were found particularly helpful in the context of gaining additional information from the data collected (Table 6). The ratio of coprostanol / coprostanol+cholestanol did not change much with location or sediment depth suggesting the relative importance of the different cholesterol reduction pathways did not change very much with time or

location in the marsh. The ratio of epicoprostanol (formed from coprostanol in activated sludge) to coprostanol has been used as an indication of treated *vs* non-treated sewage. Although this ratio fluctuated, it was difficult to rationalize these differences in terms of extent of sewage treatment.

Table 6. Comparison of fecal sterols in other tropical wetlands.

| Sample | A Coprostanol nmoles/gdw | B Epicoprostanol nmoles/gdw | C Cholesterol nmoles/gdw | D Cholestanol nmoles/gdw | A/D | B/A | A/C | A/A+D |
|---|---|---|---|---|---|---|---|---|
| Human feces[1] | 8,824.29 | | 746.08 | | | | 11.83 | |
| Barcelona S1[2] | 1,003.34 | 12.86 | 205.81 | 41.16 | 24.38 | 0.01 | 4.88 | 0.96 |
| Barcelona S2[2] | 115.77 | 5.15 | 25.73 | 18.01 | 6.43 | 0.04 | 4.50 | 0.87 |
| Barcelona S3[2] | 87.47 | 3.86 | 23.15 | 10.29 | 8.50 | 0.04 | 3.78 | 0.89 |
| Barcelona S4[2] | 61.74 | 2.57 | 51.45 | 7.72 | 8.00 | 0.04 | 1.20 | 0.89 |
| Barcelona S5[2] | 38.59 | 1.29 | 30.87 | 7.72 | 5.00 | 0.03 | 1.25 | 0.83 |
| Barcelona S7[2] | 3.34 | 0.26 | 2.57 | 1.03 | 3.25 | 0.08 | 1.30 | 0.76 |
| Barcelona S7[2] | 2.57 | 0.21 | 1.29 | 0.64 | 4.00 | 0.08 | 2.00 | 0.80 |
| Havana, Cuba S8[2] | 2.83 | 0.26 | 8.23 | 1.75 | 1.62 | 0.09 | 0.34 | 0.62 |
| Havana, Cuba S9[2] | 1.05 | 0.10 | 2.57 | 1.41 | 0.75 | 0.10 | 0.41 | 0.43 |
| Kirchmer criterion[3] | 1.03 | | | | | | | |
| Murtaugh criterion[4] | 0.51 | | | | | | | |
| Dutka criterion[5] | 0.13 | | | | | | | |

[1]Nichols et al., 1996
[2]Grimalt et al., 1990
[3]Kirchmer, 1971
[4]Murtaugh and Bunch, 1967
[5]Dutka et al., 1974

## Benzo[a]pyrene data

The Violet Marsh has had a history of BaP contamination and the recent flooding has made this contamination more pervasive through the marsh. BaP levels in the bottom sediments from 9 of the 18 core samples collected exceeded the EPA sediment criterion of 0.062 µg/gdw (Table 7). The sediments that chronically exceeded this criterion came from Bayou Bienvenue, the sewage treatment plant, and around pump stations #2 and #3. This historic BaP contamination did not extend far into the marsh (e.g., sediment 12 = 0.0 µg/gdw). When considering the most recently deposited sediments, the number of cores showing measurable BaP levels and the levels of BaP in these sediments indicated that the flooding resulted in the addition of BaP to the marsh in excess of the historically deposited levels. The EPA BaP sediment criterion was exceeded in the sediments most recently deposited in 16 of the 18 cores collected. The average level of BaP in the most recent sediments was 2.8 µg/gdw compared to 1.5 µg/gdw in

the historic sediments. The highest levels in both the top and bottom sediments were detected in the eastern Bayou Bienvenue.

Table 7. Benzo[a]pyrene levels in Violet Marsh sediments.

| Table | Concentration of Benzo(A)Pyrene in Top and Bottom of Cores | | | |
|---|---|---|---|---|
| Sample | | BaP ug/g *dw* | EPA criteria | LDEQ criteria |
| Location | | | 0.062 | 0.33 |
| | | | | |
| Bienvenue Basin 1 | TOP | 31.2 | > | > |
| Bienvenue Basin 2 | TOP | 2.8 | > | > |
| Bienvenue Basin 3 | TOP | 1.0 | > | > |
| Bienvenue Basin 4 | TOP | 0.0 | - | - |
| Bienvenue Basin 5 | TOP | 0.4 | > | > |
| Sewage Plant | TOP | 3.1 | > | > |
| Murphy Oil Site | TOP | 1.6 | > | > |
| Pump 2 Sed 4 | TOP | 1.4 | > | > |
| Pump 2 Sed 5 | TOP | 1.4 | > | > |
| Pump 3 Sed 8 | TOP | 0.9 | > | > |
| Pump 3 Sed 9 | TOP | 1.3 | > | > |
| Pump 4 Sed 10 | TOP | 1.5 | > | > |
| Pump 4 Sed 13 | TOP | 0.2 | > | - |
| Pump 6 Sed 1 | TOP | 1.1 | > | > |
| Pump 6 Sed 2 | TOP | 1.2 | > | > |
| Sed 11 | TOP | 0.0 | - | - |
| Sed 12 | TOP | 0.1 | > | - |
| Sed 3 | TOP | 1.1 | > | > |
| Mean | | 2.8 | | |
| Standard Deviation | | 7.1 | | |
| Median | | 1.1 | | |
| | | | | |
| Bienvenue Basin 1 | Bottom | 11.8 | > | > |
| Bienvenue Basin 2 | Bottom | 11.0 | > | > |
| Bienvenue Basin 3 | Bottom | 0.1 | > | - |
| Bienvenue Basin 4 | Bottom | 0.0 | - | - |
| Bienvenue Basin 5 | Bottom | 0.1 | > | - |
| Sewage Plant | Bottom | 0.5 | > | > |
| Murphy Oil Site | Bottom | 0.8 | > | > |
| Pump 2 Sed 4 | Bottom | 0.8 | > | > |
| Pump 2 Sed 5 | Bottom | 2.5 | > | > |
| Pump 3 Sed 8 | Bottom | 0.0 | - | - |
| Pump 3 Sed 9 | Bottom | 0.3 | > | - |
| Pump 4 Sed 10 | Bottom | 0.0 | - | - |
| Pump 4 Sed 13 | Bottom | 0.0 | - | - |
| Pump 6 Sed 1 | Bottom | 0.0 | - | - |
| Pump 6 Sed 2 | Bottom | 0.0 | - | - |
| Sed 11 | Bottom | 0.0 | - | - |
| Sed 12 | Bottom | 0.0 | - | - |
| Sed 3 | Bottom | 0.0 | - | - |
| Mean | | 1.5 | | |
| Standard Deviation | | 3.6 | | |
| Median | | 0.0 | | |

# 4 Discussion

During the Category 3-4 Hurricane Katrina, on 28-29 August 2005, 6-10 in. of rain fell in the New Orleans area. This amount was not significantly greater than many other storms. The Katrina storm surge on the Mississippi coast exceeded 20 ft in some areas, but ranged from 10-15 ft on the Louisiana coast east of New Orleans. Lake Pontchartrain was elevated a few feet for an extended time. By 29 August New Orleans levees were breached in several locations, and by 30 August 80 percent of New Orleans was flooded with up to 20 ft of brackish water.

For several days the floodwater remained high in the urbanized areas, and began to slowly recede as the levee breaches were patched and pumps were brought in or became operational. Tens of thousands of people who remained in the area were without basic necessities, and without a working sewage system. The main sewage treatment plant was submerged, damaged, and completely out of operation for several weeks. The smaller plant on the west bank received extensive storm damage and was also not operational.

The effects of several inches of rain and wind from the Category 3 Hurricane Rita caused several refailures of the levees in New Orleans on 23-24 September, and reflooding up to 10 ft. The operational pumps pumped huge volumes of floodwater and sediment continuously for 4-5 weeks. The last of the floodwaters were declared pumped out on October 11. The flooding and flows are detailed in the modeling report in the volume (Dortch et al. 2006). The pump-out of the flooded city and the hydraulic flows resulting from this operation and the levee systems was accomplished with three separate drainage areas or polders: New Orleans proper, New Orleans East, and St. Bernard Parish and the Lower Ninth Ward. Lake Pontchartrain received the bulk of the pumped floodwater from New Orleans proper and New Orleans East. The Violet Marsh received the pumped floodwater from the Lower Ninth Ward and Chalmette area.

The USEPA and the LADEQ conducted extensive measurement operations throughout the urbanized New Orleans area from September through

December. The only EPA and LADEQ floodwater and sediment microbiology data available are for fecal coliform bacteria. LSU (Pardue et al. 2005) and Texas Tech (Presley et al. 2006) led independent sampling expeditions in flooded New Orleans, principally in limited parts of New Orleans proper. They reported on a greater variety of contaminants over a more limited area than the EPA data. Much of the sewerage system was antiquated and permanently damaged from the flooding. Even during normal storms without flooding, the sewers cross flow into storm drainage (Pardue et al. 2005). The main EPA warning concerning contaminants in the floodwater was to avoid contact due to elevated sewage levels: *http://www.epa.gov/katrina/precautions.html*. Much raw sewage, particularly in the Lower Ninth Ward and Chalmette area polder, was still evident in surface waters when the authors sampled (February 2006).

The recreational (swimming) water criteria for bodily contact and accidental or incidental ingestion are developed in terms of other groups of organisms. The applicable standard is the primary contact recreational water quality criterion, which is 400 cfu/100 mL for fecal coliform bacteria (USEPA 2003, LADEQ 2004). This standard was exceeded in 53 of the 139 EPA Katrina water samples from Orleans and St. Bernard Parishes. The averages of the fecal coliform bacteria in cfu/100 mL reported in the EPA Katrina water samples from the three polders were 21,381 in New Orleans proper, 3,308 in New Orleans East and 1,287 in St. Bernard Parish and the Lower Ninth Ward. There are very few bacteriological sediment standards. The large National Sediment Quality Survey (USEPA 2004b) contains no bacteriological data. The federal biosolids rules are applicable to transported sediments that have been impacted by sewage sludge. The biosolids residential standard (40 CFR 503.32) for fecal coliform bacteria is 1000 cfu/g. This standard was exceeded by 162 of the 569 EPA Katrina sediment samples from Orleans and St. Bernard Parishes. The averages of the fecal coliform bacteria in cfu/g reported in the EPA Katrina sediment samples from the three polders were 31,645 in New Orleans proper, 9,980 in New Orleans East, and 30,196 in St. Bernard Parish and the Lower Ninth Ward.

The potential for infections from pathogens in sewage waste was the primary Katrina-related health concern of the EPA and CDC. Airborne molds are another microbial concern in New Orleans. The EPA issued flood-related mold warnings, especially concerning the black molds related to *Stachybotrys chartarum:*

(*http://www.epa.gov/katrina/healthissues.html#floodmold*). This report does not cover airborne pathogens, only the pathogens reported in the floodwaters and sediment.

The ERDC Environmental Microbiology Team supported the environmental modeling effort required for IPET Task 9 by obtaining and reducing data on fecal contamination and providing it to ERDC environmental modelers (Table 2). The fecal coliform data as a whole do not appear to result from random dilutions of a fecal source or sources because of the large number of non-detects reported. Once the non-detect values are removed, the remaining numerical values do tend to follow an expected unimodal lognormal distribution characteristic of random dilutions of a fecal source or sources. The reported non-detects appear to result from a separate source or sources of more dilute material, resulting in a bimodal distribution for the fecal coliform data as a whole. Several further outlying areas, including the Mississippi Sound and the Mississippi River Delta, are likely to have environmental impacts from the levee failures that are more dilute than the nearby ecosystems. These remote ecosystems are not modeled in this report, and samples were not collected from the remote areas.

Screening of New Orleans water and sediment samples for the coliform bacteria found in fecal material and correlated to infectious human disease frequently showed fecal coliform bacterial levels high above the regulatory levels of concern. As a result, health advisories due to infectious material in the flooded New Orleans areas were issued. The advisories were warranted. Assessment of the actual human health impacts due to infectious agents as a result of the flood is an ongoing process. Of the 10,047 New Orleans patient visits during and immediately after the flooding for which information was available to the Center for Disease Control and Prevention (CDC 2006), the most common were gastrointestinal, acute respiratory and skin infections. However, it will probably not be possible to capture all the data on illness of New Orleans residents who left the area and received medical treatments for infections. In the context of this report, it is important to point out that the high levels of fecal coliform bacteria revealed by the screening procedures did detect a human health risk due to infectious agents, that health advisories were issued, and that some summaries of impacts of human infections have been recently published. This series of events identifies a potential source of infectious materials that constitute a real environmental risk of unknown magnitude

and duration on the environment around New Orleans as the city was pumped out and debris is removed.

Extending the fecal coliform indicator screening level analysis to areas adjacent to New Orleans is one of the few options open to use the data that are currently available. Simple water dilution calculations and coliform bacteria die-off rates in estuarine water indicate that fecal coliform counts would be below levels of concern for the majority of Lake Pontchartrain. This is indeed observed in the most recent data from the Lake Pontchartrain Basin Foundation. While this is good news, these data should not be equated to the lack of an environmental problem. According to EPA guidance and federal law (BEACH Act), fecal streptococci should have been used as the fecal indicator in estuarine water and not fecal coliform bacteria. The very high levels of fecal coliform bacteria in the floodwater indicated an obvious health risk. However, the interpretation of low fecal coliform counts in estuarine water in terms of risk to human health is problematic. Lack of correlation between low fecal coliform counts and human illness is one of the reasons EPA in 1986 changed its guidance in estuarine waters to the use of fecal streptococci. Additionally, recent literature has revealed that we are only beginning to understand the part of the life cycle of microbial pathogens of humans that occurs outside the human host. Taken together, the message here is that the current lack of an indicator of fecal waste problem in New Orleans and Lake Pontchartrain should not be interpreted as the absence of an environmental problem. On the other hand, Lake Pontchartrain itself is a recovering ecosystem with a long history of fecal and chemical pollution. It is not possible, with the data currently available, to evaluate the impact of the pump-out on the already impacted lake.

In contrast, much of the Violet Marsh is confined by levees and this small confined area received a great volume of material that was pumped out of the urbanized area of New Orleans. The authors were able to select specific tests and sample sites, and perform a quick survey of this system. As a result, we were able to show a probable environmental impact of BaP and fecal contamination that resulted from the pump-out of the Lower Ninth Ward of New Orleans and the Chalmette area that exceeded the historic level of BaP and fecal contamination that this system normally receives. The Violet Marsh was shown to have levels of contamination and ranges of indicators similar to other sewage-impacted wetlands areas (Grimalt et al. 1990) that are well above suggested sediment quality criteria (Kirchmer

1971, Murtaugh and Bunch 1967, Dutka et al. 1974). Other chemical tracers of anthropogenic contamination were also evident in the GC/MS analyses, but time did not permit a more detailed environmental forensics analysis of the data. Additional analyses are required to remove uncertainty due to assumptions that were made and the minimal statistical design of our Violet Marsh survey, and to quantify these impacts.

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# List of Abbreviations

| | |
|---|---|
| IPET | Interagency Performance Evaluation Task Force |
| BaP | benzo[a]pyrene |
| ERDC | U.S. Army Engineer Research and Development Center |
| USEPA | U.S. Environmental Protection Agency |
| SD | standard deviation |
| LADEQ | Louisiana Department of Environmental Quality |
| ng | nanogram |
| L | liter |
| cfu | colony forming unit |
| mL | milliliter |
| μg | microgram |
| g | gram |
| DEQ | Department of Environmental Quality |
| CFR | Code of Federal Regulations |
| gdw | gram dry weight |
| ILSI | International Life Sciences Institute |
| pmol | pico-mol |
| nmol | nano-mol |
| ppb | parts per billion |
| GC/MS | gas chromatography mass spectrometer |
| TPH | total petroleum hydrocarbons |
| NO | New Orleans |
| COE | Corps of Engineers |
| SS | stainless steel |
| v.v.v.v | volume to volume to volume to volume |
| DCM | dichloromethane |
| LLQ | lower limit for quantization |

| | |
|---|---|
| LLD | lower limit of detection |
| TMS | trimethylchlorosilane |
| μm | micro-meter |
| eV | electron volts |
| USGS | United States Geological Survey |
| LSU | Louisiana State University |
| STORET | EPA/LADEQ Katrina Central Data Warehouse (*http://oaspub.epa.gov/storetkp/dw*) |
| SQL | Sample quantization level |
| UCL | Upper confidence level |
| MPN | Most probable number |

# Appendix A: LPBF data

## Lake Pontchartrain Basin Foundation
## Basin-Wide Water Quality Monitoring Program
## LPBF MASTER DATABASE 2005

| Site | Date | Water Temp | Diss Oxy | Spec Cond | Salinity | Turbidity | pH | Fecal Coliform | Enterococci |
|---|---|---|---|---|---|---|---|---|---|
| | | °C | mg/L | mS/cm | ppt | NTU | | MPN/100 mL | MPN/100 mL |
| 1 | 1/4/2005 | 12.1 | 9.48 | 9.28 | 5.2 | 3.18 | 7.98 | 33 | |
| 2 | 1/4/2005 | 13 | 9.19 | 8.02 | 4.5 | 1.05 | 7.78 | 13 | |
| 3 | 1/4/2005 | 11.6 | 8.72 | 8.91 | 5 | 2.88 | 7.62 | 23 | |
| 4 | 1/4/2005 | 11.7 | 10.06 | 9.11 | 5.1 | 2.48 | 7.45 | 79 | |
| 5 | 1/4/2005 | 13.5 | 8.97 | 10.19 | 5.8 | 1.16 | 7.76 | | |
| 6 | 1/4/2005 | 17.5 | 7.55 | 0.04 | 0 | 5.25 | 7.29 | 130 | |
| 7 | 1/4/2005 | 15.6 | 8.24 | 2.63 | 1.4 | 6.89 | 6.97 | 79 | |
| 8 | 1/4/2005 | 16.8 | 10.1 | 8.95 | 5 | 3.53 | 7.67 | 170 | |
| 9 | 1/4/2005 | 18.6 | 8.58 | 9.09 | 5.1 | 2.67 | 7.48 | 4.5 | |
| 10 | 1/4/2005 | 16.2 | 10.83 | 7.15 | 4 | 8.02 | 7.62 | 49 | |
| 1 | 1/11/2005 | 15.7 | 8.6 | 9.11 | 5.1 | 3.17 | 7.46 | 49 | |
| 2 | 1/11/2005 | 15.5 | 5.31 | 9.14 | 5.1 | 2.03 | 7.52 | 110 | |
| 3 | 1/11/2005 | 15.1 | 7.1 | 8.83 | 4.9 | 1.65 | 7.47 | 11 | |
| 4 | 1/11/2005 | 14.6 | 7.41 | 8.98 | 5 | 1.8 | 7.27 | 79 | |
| 5 | 1/11/2005 | 15 | 6.89 | 9.64 | 5.5 | 0.87 | 7.62 | | |
| 6 | 1/11/2005 | 16 | 8.52 | 0.04 | 0 | 13.3 | 6.65 | 920 | |
| 7 | 1/11/2005 | 16.2 | 6.15 | 1.5 | 0.8 | 18.1 | 6.48 | 920 | |
| 8 | 1/11/2005 | 16.9 | 7.43 | 6.19 | 3.4 | 5.61 | 6.69 | 1600 | |
| 9 | 1/11/2005 | 17.3 | 8.97 | 9.12 | 5.1 | 2.95 | 7 | | |
| 10 | 1/11/2005 | 17.7 | 9.74 | 9.27 | 5.2 | 6.01 | 7.44 | 49 | |
| 1 | 1/12/2005 | 15.8 | 7.76 | 9.37 | 5.3 | 1.5 | 7.46 | 49 | |
| 2 | 1/12/2005 | 15.4 | 6.28 | 9.37 | 5.3 | 2.08 | 7.12 | 33 | |
| 3 | 1/12/2005 | 15.5 | 7.12 | 9.17 | 5.2 | 2.54 | 7.11 | 33 | |
| 4 | 1/12/2005 | 15.2 | 6.87 | 9.28 | 5.2 | 1.75 | 7.09 | 70 | |

| Site | Date | Water Temp | Diss Oxy | Spec Cond | Salinity | Turbidity | pH | Fecal Coliform | Enterococci |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 1/12/2005 | 16.3 | 7.09 | 9.71 | 5.5 | 0.91 | 7.45 | 23 | |
| 6 | 1/12/2005 | 17 | 7.9 | 0.04 | 0 | 12.4 | 6.76 | 540 | |
| 7 | 1/12/2005 | 16.7 | 6.37 | 1.26 | 0.6 | 16 | 6.26 | 920 | |
| 8 | 1/12/2005 | 17 | 8.57 | 8.24 | 4.6 | 4.68 | 6.73 | 920 | |
| 9 | 1/12/2005 | 18.2 | 8.18 | 9.09 | 5.1 | 12.9 | 6.88 | 79 | |
| 10 | 1/12/2005 | 18.2 | 9.36 | 9.26 | 5.2 | 4.21 | 7.54 | 350 | |
| 1 | 1/18/2005 | 9.6 | 10.13 | 8.45 | 4.7 | 52.5 | 7.61 | 240 | 75 |
| 2 | 1/18/2005 | 9.2 | 10.08 | 8.4 | 4.6 | 37 | 7.6 | 79 | 20 |
| 3 | 1/18/2005 | 10.4 | | 9.34 | 5.2 | 28.6 | 7.59 | 49 | 10 |
| 4 | 1/18/2005 | 9.8 | | 9.67 | 5.4 | 33.8 | 7.53 | 130 | 10 |
| 5 | 1/18/2005 | 6.2 | | 9.42 | 5.2 | 24.5 | 7.66 | 70 | 42 |
| 6 | 1/18/2005 | 8.7 | | | | 11.6 | 7.68 | 240 | 164 |
| 7 | 1/18/2005 | 11 | | | | 22.7 | 6.6 | 1600 | 42 |
| 8 | 1/18/2005 | 10.1 | | | | 4.63 | 6.82 | 130 | 75 |
| 9 | 1/18/2005 | 7.4 | | | | 1.18 | 7.16 | 7.8 | 5 |
| 10 | 1/18/2005 | 6.8 | | | | 4.67 | 7.48 | 33 | 5 |
| 1 | 1/25/2005 | 10 | 8.92 | 7.25 | 4 | 13.6 | 8.2 | 22 | 10 |
| 2 | 1/25/2005 | 10.3 | 7.48 | 8.43 | 4.7 | 16.9 | 7.83 | 46 | 10 |
| 3 | 1/25/2005 | 10.5 | 8.63 | 8.72 | 4.9 | 21.6 | 7.64 | 79 | 20 |
| 4 | 1/25/2005 | 10.6 | 8.79 | 10.17 | 5.8 | 6.82 | 7.6 | 13 | 5 |
| 5 | 1/25/2005 | 8 | 9.68 | 10.35 | 5.8 | 12.3 | 7.66 | 17 | 5 |
| 6 | 1/25/2005 | 9.3 | 9.9 | 0.04 | 0 | 6.3 | 7.6 | 27 | 137 |
| 7 | 1/25/2005 | 9.7 | 8.85 | 3.69 | 2 | 9.52 | 6.94 | 49 | 20 |
| 8 | 1/25/2005 | 9.9 | 9.37 | 8.23 | 4.6 | 5.65 | 7.05 | 170 | 10 |
| 9 | 1/25/2005 | 8.8 | 10.53 | 8.96 | 5 | 14.3 | 7.05 | 7.8 | 5 |
| 10 | 1/25/2005 | 10.1 | 10.18 | 9.18 | 5.1 | 33.5 | 7.29 | 130 | 5 |
| 1 | 2/1/2005 | 11.9 | 9.51 | 6.31 | 3.5 | 59.3 | 7.73 | 540 | 453 |
| 2 | 2/1/2005 | 12.1 | 9.67 | 5.45 | 2.9 | 56.7 | 7.78 | 350 | 1091 |
| 3 | 2/1/2005 | 12 | 9.75 | 7.12 | 3.9 | 25.8 | 7.64 | 540 | 1184 |
| 4 | 2/1/2005 | 11.9 | 9.9 | 7.5 | 4.2 | 17.9 | 7.46 | 540 | 738 |
| 5 | 2/1/2005 | 12 | 9.42 | 9.26 | 5.2 | 39.2 | 7.51 | 350 | 504 |
| 6 | 2/1/2005 | 12.1 | 9.19 | 0.05 | 0 | 19.6 | 7.6 | 1700 | 2100 |

| Site | Date | Water Temp | Diss Oxy | Spec Cond | Salinity | Turbidity | pH | Fecal Coliform | Enterococci |
|---|---|---|---|---|---|---|---|---|---|
| 7 | 2/1/2005 | | | | | | | | |
| 8 | 2/1/2005 | 11.9 | 8.2 | 8.02 | 4.5 | 3.91 | 6.83 | 1600 | 1091 |
| 9 | 2/1/2005 | 11.9 | 9.8 | 9.24 | 5.2 | 2.06 | 6.88 | 21 | 5 |
| 10 | 2/1/2005 | 11.8 | 9.43 | 11.97 | 6.9 | 4.66 | 6.99 | 130 | 192 |
| 1 | 2/2/2005 | 12.5 | 9.73 | 5.02 | 2.7 | 58.4 | 7.68 | 1700 | 2100 |
| 2 | 2/2/2005 | 12.3 | 8.91 | 6.53 | 3.6 | 29.4 | 7.72 | 1600 | 2100 |
| 3 | 2/2/2005 | 12.1 | 9.48 | 7.35 | 4.1 | 24.4 | 7.51 | 350 | 207 |
| 4 | 2/2/2005 | 12 | 8.59 | 7.84 | 4.4 | 19 | 7.53 | 220 | 478 |
| 5 | 2/2/2005 | 12.4 | 8.95 | 10.04 | 5.7 | 3.48 | 7.48 | 49 | 178 |
| 6 | 2/2/2005 | 11.5 | 9.54 | 0.03 | 0 | 52.2 | 6.41 | 1700 | 2100 |
| 7 | 2/2/2005 | | | | | | | | |
| 8 | 2/2/2005 | 12 | 8.51 | 3.6 | 1.9 | 22.6 | 6.34 | 1700 | 2100 |
| 9 | 2/2/2005 | 12.2 | 9.68 | 9.03 | 5.1 | 6.19 | 6.62 | 920 | 406 |
| 10 | 2/2/2005 | 12.4 | 9.28 | 14.09 | 8.2 | 8.01 | 6.85 | 23 | 75 |
| 1 | 2/15/2005 | 13.7 | 9.33 | 6.52 | 3.6 | 4.84 | 10.1 | 1600 | 254 |
| 2 | 2/15/2005 | 13.8 | 6.16 | 7.04 | 3.9 | 4.07 | 7.8 | 130 | 31 |
| 3 | 2/15/2005 | 13.5 | 8.68 | 6.15 | 3.4 | 2.72 | 8.02 | 49 | 5 |
| 4 | 2/15/2005 | 13.7 | 8.61 | 7.38 | 4.1 | 3.67 | 7.79 | 33 | 10 |
| 5 | 2/15/2005 | 14.6 | 6.17 | 7.41 | 4.1 | 1.54 | 8.24 | 17 | 10 |
| 6 | 2/15/2005 | 14.6 | 9.7 | 0.04 | 0 | 23.6 | 7.13 | 1700 | 2100 |
| 7 | 2/15/2005 | 15 | 7.78 | 1.62 | 0.8 | 13.2 | 6.53 | 79 | 75 |
| 8 | 2/15/2005 | 14.8 | 8.49 | 7.15 | 4 | 14.8 | 6.63 | 1600 | 2100 |
| 9 | 2/15/2005 | 15.3 | 9.86 | 8.71 | 4.9 | 5.38 | | 4.5 | 5 |
| 10 | 2/15/2005 | 15.5 | 10.17 | 8.26 | 4.6 | 5.63 | 6.97 | 110 | 10 |
| 1 | 2/22/2005 | 17.5 | 7.24 | 5.86 | 3.2 | 4.34 | 7.67 | 4.5 | 5 |
| 2 | 2/22/2005 | 16.7 | 6.74 | 7.24 | 4 | 2.31 | 7.38 | 46 | 31 |
| 3 | 2/22/2005 | 16.6 | 6.48 | 6.78 | 3.7 | 2.68 | 7.46 | 130 | 5 |
| 4 | 2/22/2005 | 17 | 5.79 | 7.35 | 4.1 | 3.2 | 7.48 | 31 | 5 |
| 5 | 2/22/2005 | 18.9 | 4.48 | 9.04 | 5.1 | 1.19 | 7.66 | 7.8 | 31 |
| 6 | 2/22/2005 | 18 | 7.93 | 0.04 | 0 | 6.71 | 7.2 | 220 | 75 |
| 7 | 2/22/2005 | 17.6 | 7.63 | 1.97 | 1 | 13.3 | 6.43 | 49 | 20 |
| 8 | 2/22/2005 | 17.9 | 7.73 | 6.89 | 3.8 | 7.81 | 6.64 | 350 | 53 |

| Site | Date | Water Temp | Diss Oxy | Spec Cond | Salinity | Turbidity | pH | Fecal Coliform | Enterococci |
|---|---|---|---|---|---|---|---|---|---|
| 9 | 2/22/2005 | 19.2 | 8.06 | 8.79 | 4.9 | 15.4 | 6.8 | 4.5 | 5 |
| 10 | 2/22/2005 | 17.9 | 9.12 | 8.57 | 4.8 | 3.45 | 6.95 | 33 | 5 |
| 1 | 2/23/2005 | 16.2 | 6.72 | 6.17 | 3.4 | 3.17 | 10.1 | 23 | 10 |
| 2 | 2/23/2005 | 17.2 | 6.64 | 7 | 3.9 | 3.46 | 7.78 | 49 | 99 |
| 3 | 2/23/2005 | 16.9 | 5.95 | 7.12 | 3.9 | 2.26 | 7.51 | 79 | 64 |
| 4 | 2/23/2005 | 16.8 | 5.76 | 7.12 | 3.9 | 3.16 | 7.16 | 13 | 5 |
| 5 | 2/23/2005 | 17.5 | 4.34 | 8.24 | 4.6 | 1.22 | 7.1 | 1 | 5 |
| 6 | 2/23/2005 | 18.9 | 7.84 | 0.04 | 0 | 8.63 | 7.04 | 110 | 150 |
| 7 | 2/23/2005 | 18.9 | 7.45 | 1.62 | 0.8 | 11.9 | 6.44 | 17 | 20 |
| 8 | 2/23/2005 | 18.7 | 8.23 | 8.36 | 4.7 | 6.81 | 6.66 | 140 | 20 |
| 9 | 2/23/2005 | 18.7 | 8.62 | 8.65 | 4.8 | 3.41 | 6.86 | 7.8 | 5 |
| 10 | 2/23/2005 | 19.1 | 8.58 | 8.53 | 4.8 |  | 6.96 | 140 | 31 |
| 1 | 3/1/2005 | 14.5 | 9.06 | 5.69 | 3.1 | 26.6 | 7.66 | 350 | 42 |
| 2 | 3/1/2005 | 14.1 | 9.5 | 6.22 | 3.4 | 24.3 | 7.65 | 280 | 53 |
| 3 | 3/1/2005 | 14.1 | 10.76 | 6.66 | 3.9 | 29.2 | 7.62 | 350 | 53 |
| 4 | 3/1/2005 | 14.5 | 9.25 | 7.21 | 4.1 | 30.8 | 7.48 | 280 | 31 |
| 5 | 3/1/2005 | 13.2 | 10.22 | 8.05 | 4.5 | 25 | 7.8 | 79 | 10 |
| 6 | 3/1/2005 |  |  |  |  |  |  |  |  |
| 7 | 3/1/2005 | 14.4 | 6.93 | 1.88 | 1 | 14.3 | 7.7 | 49 | 87 |
| 8 | 3/1/2005 | 14.2 | 6.49 | 4.15 | 2.2 | 20.9 | 6.88 | 350 | 207 |
| 9 | 3/1/2005 | 11.9 | 10.17 | 7.12 | 3.9 | 28.1 | 6.96 | 49 | 53 |
| 10 | 3/1/2005 | 14.6 | 9.49 | 7.74 | 4.3 | 29.1 | 7.14 | 49 | 31 |
| 1 | 3/8/2005 | 15.3 | 9.37 | 6.29 | 3.5 | 46.9 | 7.55 | 110 | 99 |
| 2 | 3/8/2005 | 14.6 | 9.04 | 7.95 | 4.4 | 49.4 | 7.71 | 920 | 560 |
| 3 | 3/8/2005 | 15.2 | 9.9 | 8.61 | 4.8 | 45.2 | 7.7 | 1700 | 207 |
| 4 | 3/8/2005 | 15 | 9.86 | 8.51 | 4.6 | 47.4 | 7.69 | 1700 | 99 |
| 5 | 3/8/2005 | 14.5 | 8.96 | 9.63 | 5.4 | 25.2 | 7.89 | 130 | 87 |
| 6 | 3/8/2005 | 15 | 8.44 | 0.4 | 0 | 11 | 8 | 140 | 406 |
| 7 | 3/8/2005 | 15.3 | 7.85 | 3.04 | 1.6 | 12.2 | 7.31 | 49 | 10 |
| 8 | 3/8/2005 | 15.5 | 8.35 | 6.09 | 3.3 | 9.9 | 7.17 | 79 | 10 |
| 9 | 3/8/2005 | 14.2 | 9.63 | 6.64 | 3.7 | 32.5 | 7.27 | 49 | 31 |
| 10 | 3/8/2005 | 16 | 8.71 | 7.7 | 4.3 | 47.3 | 7.32 | 140 | 75 |

| Site | Date | Water Temp | Diss Oxy | Spec Cond | Salinity | Turbidity | pH | Fecal Coliform | Enterococci |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 3/15/2005 | 16.7 | 8.75 | 5.33 | 2.9 | 50.2 | 7.73 | 79 | 64 |
| 2 | 3/15/2005 | 15.9 | 9.13 | 6.3 | 3.5 | 29.7 | 7.62 | 240 | 20 |
| 3 | 3/15/2005 | 16.5 | 9.45 | 6.37 | 3.6 | 29.6 | 7.75 | 33 | 42 |
| 4 | 3/15/2005 | 15.8 | 8.06 | 6.72 | 3.7 | 18.7 | 7.64 | 33 | 42 |
| 5 | 3/15/2005 | 15.1 | 5.05 | 9.47 | 5.3 | 26.9 | 7.71 | 130 | 64 |
| 6 | 3/15/2005 | 15.7 | 7.84 | 0.04 | 0 | 5.15 | 8.07 | 49 | 99 |
| 7 | 3/15/2005 | 16.6 | 7.88 | 3.5 | 1.8 | 7.91 | 7.19 | 6.8 | 10 |
| 8 | 3/15/2005 | 16.6 | 7.77 | 5.8 | 3.2 | 5.29 | 7.13 | 33 | 5 |
| 9 | 3/15/2005 | 15.5 | 8.43 | 6.32 | 3.5 | 4.12 | 7.32 | 7.8 | 5 |
| 10 | 3/15/2005 | 15.4 | 9.09 | 8 | 4.5 | 18.7 | 7.62 | 7.8 | 10 |
| 1 | 3/22/2005 | 16.7 | 8.61 | 5.71 | 3.1 | 16.1 | 7.73 | 11 | 31 |
| 2 | 3/22/2005 | 16.5 | 8.03 | 6.28 | 3.5 | 5.67 | 7.68 | 23 | 5 |
| 3 | 3/22/2005 | 15.9 | 7.4 | 7 | 3.9 | 5.1 | 7.58 | 7.8 | 10 |
| 4 | 3/22/2005 | 15.8 | 7.4 | 8.2 | 4.6 | 4.99 | 7.45 | 46 | 10 |
| 5 | 3/22/2005 | 17 | 7.13 | 10.01 | 5.7 | 2.01 | 7.56 | 70 | 5 |
| 6 | 3/22/2005 | 17.4 | 8.14 | 0.04 | 0 | 51.6 | 7.57 | 49 | 87 |
| 7 | 3/22/2005 | 17.6 | 7.95 | 2.82 | 1.5 | 11.2 | 6.81 | 49 | 20 |
| 8 | 3/22/2005 | 17.6 | 8.46 | 5.99 | 3.3 | 14 | 6.75 | 240 | 53 |
| 9 | 3/22/2005 | 18.9 | 8.21 | 6.31 | 3.4 | 15.1 | 6.82 | 49 | 31 |
| 10 | 3/22/2005 | 17.5 | 9.26 | 5.94 | 3.2 | 5.97 | 7.1 | 130 | 10 |
| 1 | 3/29/2005 | 18.3 | 5.14 | 5.25 | 2.8 | 15.9 | 7.92 | 33 | 20 |
| 2 | 3/29/2005 | 17.9 | 7.98 | 5.96 | 3.3 | 10.7 | 7.58 | 49 | 5 |
| 3 | 3/29/2005 | 18.2 | 9.55 | 6.11 | 3.3 | 13.1 | 7.91 | 49 | 5 |
| 4 | 3/29/2005 | 18.2 | 6.91 | 6.58 | 3.6 | 15.5 | 7.68 | 110 | 31 |
| 5 | 3/29/2005 | 18.5 | 9.47 | 7.47 | 4.1 | 12.8 | 7.6 | 23 | 5 |
| 6 | 3/29/2005 | 15.8 | 7.45 | 0.04 | 0 | 6.07 | 7.79 | 350 | 254 |
| 7 | 3/29/2005 | 18.9 | 5.75 | 3 | 1.6 | 8.98 | 6.86 | 7.8 | 10 |
| 8 | 3/29/2005 | 19.3 | 6.27 | 5.95 | 3.2 | 9.19 | 6.86 | 33 | 42 |
| 9 | 3/29/2005 | 17.6 | 8.36 | 6.76 | 3.7 | 21.2 | 7.13 | 11 | 10 |
| 10 | 3/29/2005 | 20.4 | 9.52 | 6.4 | 3.5 | 21.5 | 8.2 | 130 | 10 |
| 1 | 4/5/2005 | 19.2 | | | | 10.1 | 7.45 | 130 | 5 |
| 2 | 4/5/2005 | 18.8 | | | | 9.25 | 7.44 | 23 | 5 |

| Site | Date | Water Temp | Diss Oxy | Spec Cond | Salinity | Turbidity | pH | Fecal Coliform | Enterococci |
|---|---|---|---|---|---|---|---|---|---|
| 3 | 4/5/2005 | 18.9 | | | | 12.5 | 7.3 | 33 | 453 |
| 4 | 4/5/2005 | 18.8 | | | | 6.45 | 7.48 | 350 | 64 |
| 5 | 4/5/2005 | 19.2 | | | | 4.37 | 7.32 | 33 | 20 |
| 6 | 4/5/2005 | 17.4 | 6.96 | 0.04 | 0 | 14.8 | 7.4 | 920 | 150 |
| 7 | 4/5/2005 | 19.2 | 5.84 | 1.85 | 0.9 | 9.79 | 6.72 | 110 | 10 |
| 8 | 4/5/2005 | 19.4 | 5.68 | | 2.8 | 11.6 | 6.71 | 49 | 87 |
| 9 | 4/5/2005 | 19 | 7.18 | 6.59 | 3.6 | 49.6 | 7.01 | 33 | 5 |
| 10 | 4/5/2005 | 20.5 | 7.51 | 5.54 | 3 | 33.6 | 7.49 | 240 | 42 |
| 1 | 4/11/2005 | 21.3 | 7.58 | 4.62 | 2.5 | 23 | 7.68 | 49 | 10 |
| 2 | 4/11/2005 | 20.9 | 7.55 | 5.3 | 2.9 | 5.92 | 7.47 | 49 | 5 |
| 3 | 4/11/2005 | 20.7 | 7.42 | 5.71 | 3.1 | 7.28 | 7.39 | 79 | 271 |
| 4 | 4/11/2005 | 20.6 | 7.33 | 5.96 | 3.2 | 6.51 | 7.22 | 79 | 20 |
| 5 | 4/11/2005 | 20.8 | 8.06 | 7.59 | 4.2 | 2.34 | 7.55 | 22 | 10 |
| 6 | 4/11/2005 | 19.8 | 7.62 | 0.04 | 0 | 7.99 | 7.41 | 130 | 238 |
| 7 | 4/11/2005 | 21.1 | 7.12 | 2.74 | 1.4 | 10.8 | 6.65 | 49 | 5 |
| 8 | 4/11/2005 | 21.7 | 7.34 | 6.49 | 3.6 | 10.2 | 6.84 | 110 | 42 |
| 9 | 4/11/2005 | 21 | 8.1 | 6.68 | 3.7 | 19.4 | 7.06 | 49 | 20 |
| 10 | 4/11/2005 | 21.2 | 8.42 | 3.06 | 1.6 | 35 | 7.05 | 240 | 87 |
| 1 | 4/12/2005 | 21.1 | 7.06 | 4.1 | 2.2 | 49.1 | 7.58 | 1700 | 2100 |
| 2 | 4/12/2005 | 20.5 | 7.63 | 5.22 | 2.8 | 15.4 | 7.41 | 1700 | 2100 |
| 3 | 4/12/2005 | 20.4 | 8.51 | 5.25 | 2.8 | 23.1 | 7.5 | 1700 | 2100 |
| 4 | 4/12/2005 | 20 | 7.77 | 4.24 | 2.3 | 31.7 | 7.28 | 1700 | 2100 |
| 5 | 4/12/2005 | 20.2 | 7.98 | 5.18 | 2.8 | 40.9 | 7.55 | 1700 | 2100 |
| 6 | 4/12/2005 | 18.7 | 7.28 | 0.03 | 0 | 96.1 | 7.23 | 1700 | 2100 |
| 7 | 4/12/2005 | 21 | 5.8 | 4.17 | 2.2 | 14.5 | 6.45 | 220 | 406 |
| 8 | 4/12/2005 | 21.8 | 4.7 | 5.15 | 2.8 | 9.47 | 6.42 | 1600 | 1652 |
| 9 | 4/12/2005 | 21.1 | 7.64 | 5.75 | 3.1 | 32.1 | 6.96 | 130 | 164 |
| 10 | 4/12/2005 | 21.1 | 7.82 | 3.1 | 1.6 | 34.9 | 6.91 | 240 | 738 |
| 1 | 4/19/2005 | 21.3 | 8.48 | 6.06 | 3.3 | 5.36 | 7.56 | 13 | 31 |
| 2 | 4/19/2005 | 20.7 | 8.08 | 6.4 | 3.5 | 3.86 | 7.26 | 23 | 31 |
| 3 | 4/19/2005 | 20.7 | 8.39 | 7.23 | 4 | 7.79 | 7.4 | 23 | 20 |
| 4 | 4/19/2005 | 20.7 | 7.85 | 7.63 | 4.2 | 5.75 | 7.15 | 49 | 10 |

| Site | Date | Water Temp | Diss Oxy | Spec Cond | Salinity | Turbidity | pH | Fecal Coliform | Enterococci |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 4/19/2005 | 20.9 | 8.38 | 7.49 | 4.1 | 3.07 | 7.76 | 13 | 5 |
| 6 | 4/19/2005 | 18.1 | 7.67 | 0.04 | 0 | 8.65 | 7.68 | 130 | 178 |
| 7 | 4/19/2005 | 20.5 | 5.2 | 0.59 | 0.3 | 19.2 | 6.65 | 46 | 20 |
| 8 | 4/19/2005 | 21.6 | 7.09 | 6.07 | 3.3 | 6.91 | 6.73 | 70 | 10 |
| 9 | 4/19/2005 | 20.6 | 7.74 | 6.32 | 3.5 | 23 | 7.11 | 13 | 5 |
| 10 | 4/19/2005 | 22 | 8.59 | 5.66 | 3.1 | 15.8 | 7.87 | 110 | 5 |
| 1 | 4/26/2005 | 20.1 | 8.79 | 5.97 | 3.3 | 21.8 | 7.7 | 70 | 53 |
| 2 | 4/26/2005 | 20 | 8.07 | 6.65 | 3.6 | 15.1 | 7.46 | 23 | 5 |
| 3 | 4/26/2005 | 20.5 | 7.91 | 6.92 | 3.8 | 9.42 | 7.36 | 13 | 5 |
| 4 | 4/26/2005 | 20.6 | 7.23 | 6.97 | 3.8 | 7.3 | 7.24 | 33 | 31 |
| 5 | 4/26/2005 | 19.9 | 8.46 | 8.03 | 4.5 | 4.09 | 8.03 | 45 | 5 |
| 6 | 4/26/2005 | 16.7 | 7.65 | 0.05 | 0 | 11.9 | 8.25 | 1600 | 1445 |
| 7 | 4/26/2005 | 20.2 | 6.73 | 2.83 | 1.5 | 10.8 | 6.94 | 23 | 31 |
| 8 | 4/26/2005 | 21 | 6.68 | 5.76 | 3.1 | 9.11 | 6.9 | 170 | 75 |
| 9 | 4/26/2005 | 18.9 | 7.9 | 5.83 | 3.2 | 44.8 | 7.04 | 240 | 99 |
| 10 | 4/26/2005 | 20.6 | 7.68 | 4.16 | 2.2 | 37.4 | 7.04 | 49 | 124 |
| 1 | 5/3/2005 | 21.2 | 7.51 | 6.41 | 3.5 | 76.5 | 7.52 | 350 | 75 |
| 2 | 5/3/2005 | 19.8 | 8.15 | 7.02 | 3.9 | 68.1 | 7.4 | 350 | 150 |
| 3 | 5/3/2005 | 20.4 | 8.07 | 9.15 | 5.1 | 21.3 | 7.53 | 110 | 87 |
| 4 | 5/3/2005 | 20.3 | 8.01 | 9.57 | 5.4 | 21.1 | 7.53 | 79 | 10 |
| 5 | 5/3/2005 | 19.4 | 7.39 | 7.01 | 3.9 | 28.8 | 7.83 | 49 | 42 |
| 6 | 5/3/2005 | 17.7 | 7.37 | 0.04 | 0 | 11 | 7.98 | 1600 | 150 |
| 7 | 5/3/2005 | 20 | 5.12 | 0.64 | 0.3 | 15 | 7.45 | 140 | 111 |
| 8 | 5/3/2005 | 20.2 | 5.89 | 4.16 | 2.2 | 10.1 | 7.36 | 240 | 111 |
| 9 | 5/3/2005 | 20.1 | 7.69 | 5.57 | 3 | 2.53 | 7.34 | 17 | 23 |
| 10 | 5/3/2005 | 20.9 | 8.25 | 3.97 | 2.1 | 9.5 | 7.61 | 33 | 20 |
| 1 | 5/10/2005 | 22.4 | 6.41 | 6.85 | 3.8 | 3.87 | 7.53 | 7.8 | 5 |
| 2 | 5/10/2005 | 22.6 | 6.76 | 7.71 | 4.3 | 2.74 | 7.48 | 2 | 5 |
| 3 | 5/10/2005 | 22.6 | 6.38 | 7.66 | 4.2 | 4.95 | 7.95 | 13 | 5 |
| 4 | 5/10/2005 | 22.8 | 6.11 | 8.5 | 4.7 | 3.14 | 7.53 | 4.5 | 5 |
| 5 | 5/10/2005 | 22.2 | 6.26 | 8.72 | 4.9 | 2.1 | 8.46 | 2 | 5 |
| 6 | 5/10/2005 | 20.1 | 7.17 | 0.05 | 0 | 7.89 | 7.91 | 1600 | 192 |

| Site | Date | Water Temp | Diss Oxy | Spec Cond | Salinity | Turbidity | pH | Fecal Coliform | Enterococci |
|---|---|---|---|---|---|---|---|---|---|
| 7 | 5/10/2005 | 22.3 | 4.79 | 1.12 | 0.6 | 9.85 | 6.85 | 21 | 111 |
| 8 | 5/10/2005 | 23.2 | 6.77 | 5.59 | 3 | 5.12 | 6.96 | 23 | 531 |
| 9 | 5/10/2005 | 23.2 | 7.7 | 6.08 | 3.3 | 3.91 | 7.18 | 2 | 5 |
| 10 | 5/10/2005 | 24.2 | 7.99 | 6.01 | 3.3 | 7.02 | 7.35 | 49 | 5 |
| 1 | 5/17/2005 | 24.8 | 5.78 | 7.4 | 4.1 | 9.68 | 7.22 | 7.8 | 20 |
| 2 | 5/17/2005 | 24.3 | 5.75 | 7.66 | 4.2 | 19.1 | 6.93 | 130 | 5 |
| 3 | 5/17/2005 | 24.3 | 6.72 | 7.46 | 4.1 | 7.4 | 7.1 | 1700 | 2100 |
| 4 | 5/17/2005 | 24.4 | 5.87 | 7.49 | 4.1 | 12.6 | 7.04 | 33 | 31 |
| 5 | 5/17/2005 | 24.8 | 6.09 | 9.17 | 5.1 | 11.6 | 7.31 | 11 | 10 |
| 6 | 5/17/2005 | 21.8 | 6.46 | 0.04 | 0 | 5.43 | 7.97 | 130 | 124 |
| 7 | 5/17/2005 | 24.6 | 5.5 | 2.46 | 1.3 | 8.12 | 6.98 | 33 | 42 |
| 8 | 5/17/2005 | 25.7 | 6.62 | 6.53 | 3.6 | 3.81 | 7.04 | 33 | 5 |
| 9 | 5/17/2005 | 25.3 | 6.9 | 6.98 | 3.8 | 3.07 | 7.27 | 1 | 5 |
| 10 | 5/17/2005 | 26.1 | 7.05 | 6.28 | 3.4 | 8.2 | 7.39 | 11 | 10 |
| 1 | 5/24/2005 | 28.9 | 4.44 | 7.57 | 4.2 | 4.35 | 7.03 | 33 | 10 |
| 2 | 5/24/2005 | 28.6 | 5.15 | 8.01 | 4.4 | 4.97 | 7.1 | 4.5 | 10 |
| 3 | 5/24/2005 | 28.7 | 6.88 | 7.98 | 4.6 | 14.2 | 7.35 | 4.5 | 20 |
| 4 | 5/24/2005 | 28.3 | 6.21 | 8.39 | 4.6 | 15.2 | 7.29 | 140 | 406 |
| 5 | 5/24/2005 | 27.4 | 7.27 | 8.88 | 4.7 | 16.9 | 7.68 | 17 | 87 |
| 6 | 5/24/2005 | 25.3 | 6.15 | 0.05 | 0 | 6.49 | 7.06 | 49 | 222 |
| 7 | 5/24/2005 | 29.4 | 5.38 | 6.16 | 3.3 | 4.6 | 6.88 | 4.5 | 10 |
| 8 | 5/24/2005 | 28.6 | 5.39 | 2.52 | 1.3 | 14.2 | 6.78 | 17 | 5 |
| 9 | 5/24/2005 | 27.1 | 7.75 | 6.18 | 3.4 | 23.8 | 7.2 | 11 | 10 |
| 10 | 5/24/2005 | 28.4 | 6.73 | 6.71 | 3.6 | 94.7 | 7.09 | 26 | 254 |
| 1 | 5/31/2005 | 26.8 | 5.92 | 7.48 | 4.1 | 10.8 | 7.51 | 1600 | 178 |
| 2 | 5/31/2005 | 26.6 | 5.9 | 8.47 | 4.7 | 5.14 | 7.26 | 540 | 64 |
| 3 | 5/31/2005 | 26.8 | 6.33 | 8.66 | 4.8 | 3.45 | 7.15 | 350 | 324 |
| 4 | 5/31/2005 | 26.7 | 5.59 | 8.64 | 4.8 | 2.97 | 7.02 | 540 | 99 |
| 5 | 5/31/2005 | 25.7 | 6.09 | 9.14 | 5.1 | 4.82 | 7.29 | 23 | 164 |
| 6 | 5/31/2005 | 21.5 | 6.6 | 0.03 | 0 | 42.1 | 6.29 | 1600 | 2100 |
| 7 | 5/31/2005 | 24.7 | 3.87 | 1.16 | 0.6 | 10.8 | 6.26 | 920 | 1298 |
| 8 | 5/31/2005 | 23.6 | 4.47 | 1.67 | 0.8 | 14.2 | 6.16 | 1700 | 2100 |

| Site | Date | Water Temp | Diss Oxy | Spec Cond | Salinity | Turbidity | pH | Fecal Coliform | Enterococci |
|---|---|---|---|---|---|---|---|---|---|
| 9 | 5/31/2005 | 25.2 | 6.88 | 5.16 | 2.8 | 6.94 | 6.39 | 540 | 53 |
| 10 | 5/31/2005 | 25.5 | 6.78 | 7.24 | 4 | 13.6 | 6.62 | 170 | 164 |
| 1 | 6/7/2005 | 27.6 | 5.23 | 6.74 | 3.7 | 4.88 | 7.26 | 920 | 324 |
| 2 | 6/7/2005 | 27.2 | 5.51 | 7.36 | 4 | 2.45 | 7.12 | 1600 | 324 |
| 3 | 6/7/2005 | 27.5 | 5.46 | 8.6 | 4.8 | 2.24 | 7.16 | 140 | 254 |
| 4 | 6/7/2005 | 27.4 | 5.25 | 8.52 | 4.7 | 2.36 | 7.07 | 350 | 137 |
| 5 | 6/7/2005 | 26.8 | 5.77 | 9.47 | 5.3 | 4.87 | 7.64 | 1 | 10 |
| 6 | 6/7/2005 | 23.5 | 6.43 | 0.05 | 0 | 9.26 | 7.22 | 130 | 137 |
| 7 | 6/7/2005 | 27.2 | 3.52 | 2.59 | 1.3 | 6.49 | 6.01 | 79 | 64 |
| 8 | 6/7/2005 | 27.9 | 3.74 | 4.83 | 2.6 | 4.37 | 6.02 | 170 | 150 |
| 9 | 6/7/2005 | 27.6 | 6.68 | 6.15 | 3.3 | 7.55 | 6.48 | 7.8 | 5 |
| 10 | 6/7/2005 | 28.1 | 6.73 | 6.96 | 3.8 | 5.86 | 6.7 | 13 | 10 |
| 1 | 6/14/2005 | 29.2 | 5.45 | 7.38 | 4 | 4.15 | 7.49 | 13 | 5 |
| 2 | 6/14/2005 | 29.3 | 4.93 | 8.28 | 4.6 | 3.14 | 7.18 | 13 | 20 |
| 3 | 6/14/2005 | 29.6 | 6.09 | 9.19 | 5.1 | 2.94 | 7.72 | 1 | 5 |
| 4 | 6/14/2005 | 29.5 | 6.3 | 9.41 | 5.2 | 3.24 | 7.68 | 6.8 | 5 |
| 5 | 6/14/2005 | 28.2 | 4.37 | 9.63 | 5.4 | 2.9 | 7.34 | 2 | 20 |
| 6 | 6/14/2005 | 27.1 | 6.31 | 0.05 | 0 | 6.76 | 7.09 | 130 | 64 |
| 7 | 6/14/2005 | 29.8 | 4.33 | 2.82 | 1.4 | 6.12 | 6.6 | 13 | 10 |
| 8 | 6/14/2005 | 30.2 | 4.23 | 4.97 | 2.6 | 3.97 | 6.53 | 23 | 75 |
| 9 | 6/14/2005 | 30.4 | 6.33 | 6.07 | 3.3 |  | 6.86 | 33 | 10 |
| 10 | 6/14/2005 | 30.4 | 6.96 | 7.42 | 4.1 | 7.95 | 7.18 | 7.8 | 5 |
| 1 | 6/15/2005 | 29.9 | 5.25 | 7.45 | 4.1 | 3.2 | 7.11 | 4.5 | 5 |
| 2 | 6/15/2005 | 29.4 | 4.85 | 8.59 | 4.8 | 2.79 | 6.97 | 9.3 | 5 |
| 3 | 6/15/2005 | 29.4 | 6.67 | 9.37 | 5.2 | 3.35 | 7.1 | 240 | 31 |
| 4 | 6/15/2005 | 29.2 | 5.72 | 9.63 | 5.4 | 3.79 | 7.23 | 23 | 5 |
| 5 | 6/15/2005 | 29.3 | 6.07 | 9.47 | 5.3 | 7.93 | 7.36 | 49 | 31 |
| 6 | 6/15/2005 | 27.2 | 5.91 | 0.05 | 0 | 5.58 | 7.14 | 540 | 53 |
| 7 | 6/15/2005 | 30 | 3.57 | 2.15 | 1.1 | 5.58 | 5.06 | 79 | 75 |
| 8 | 6/15/2005 | 30.8 | 4.7 | 4.96 | 2.6 | 6.02 | 5.13 | 46 | 42 |
| 9 | 6/15/2005 | 30 | 6.44 | 5.83 | 3.1 | 32.4 | 5.28 | 49 | 64 |
| 10 | 6/15/2005 | 30.1 | 6.03 | 7.57 | 4.1 | 24 | 5.3 | 23 | 10 |

| Site | Date | Water Temp | Diss Oxy | Spec Cond | Salinity | Turbidity | pH | Fecal Coliform | Enterococci |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6/21/2005 | 29.1 | 4.86 | 7.98 | 4.4 | 5.58 | 6.78 | 23 | 10 |
| 2 | 6/21/2005 | 29.3 | 5.66 | 9.14 | 5.1 | 5.68 | 7.11 | 4 | 5 |
| 3 | 6/21/2005 | 29.1 | 5.35 | 9.88 | 5.5 | 2.25 | 7.05 | 130 | 5 |
| 4 | 6/21/2005 | 29.5 | 6.73 | 9.95 | 5.6 | 3.35 | 7.41 | 4.5 | 10 |
| 5 | 6/21/2005 | 28.2 | 6.25 | 10.07 | 5.6 | 3.5 | 7.63 | 2 | 5 |
| 6 | 6/21/2005 | 25 | 5.8 | 0.05 | 0 | 8.3 | 6.57 | 130 | 150 |
| 7 | 6/21/2005 | 28.7 | 3.78 | 1.59 | 0.8 | 5.57 | 6.71 | 79 | 20 |
| 8 | 6/21/2005 | 29.2 | 4.88 | 4.12 | 2.2 | 4.22 | 6.86 | 33 | 5 |
| 9 | 6/21/2005 | 29.1 | 6.24 | 4.46 | 2.4 | 1.86 | 6.89 | 4 | 5 |
| 10 | 6/21/2005 | 29.5 | 6.53 | 7.43 | 4.1 | 3.45 | 6.88 | 23 | 5 |
| 1 | 6/28/2005 | 30.9 | 4.78 | 58.5 | 4.7 | 1.84 | 6.59 | 4.5 | 5 |
| 2 | 6/28/2005 | 30.3 | 4.56 | 9.17 | 5.1 | 2.45 | 6.6 | 70 | 5 |
| 3 | 6/28/2005 | 30.2 | 4.54 | 9.77 | 5.5 | 2.27 | 6.97 | 33 | 5 |
| 4 | 6/28/2005 | 30.1 | 4.16 | 9.76 | 5.4 | 2.39 | 6.96 | 33 | 5 |
| 5 | 6/28/2005 | 28.6 | 5.75 | 9.66 | 5.4 | 6.65 | 7.34 | 7.8 | 10 |
| 6 | 6/28/2005 | 26.3 | 6.67 | 0.05 | 0 | 8.02 |  | 110 | 99 |
| 7 | 6/28/2005 | 29.9 | 5.19 | 2.66 | 1.4 | 4.92 |  | 7.8 | 5 |
| 8 | 6/28/2005 | 30.3 | 4.99 | 4.4 | 2.3 | 5.54 |  | 4.5 | 10 |
| 9 | 6/28/2005 | 29.9 | 5.91 | 4.68 | 2.5 | 3.19 |  | 4.5 | 5 |
| 10 | 6/28/2005 | 29.3 | 6.53 | 8.03 | 4.4 | 4.21 |  | 13 | 5 |
| 1 | 7/5/2005 | 30 | 5.23 | 9.22 | 4.7 | 2.02 |  | 23 | 20 |
| 2 | 7/5/2005 | 29.2 | 4.1 | 10.16 | 5.2 | 1.95 |  | 13 | 20 |
| 3 | 7/5/2005 | 29.2 | 5 | 9.54 | 5.3 | 2.93 |  | 23 | 5 |
| 4 | 7/5/2005 | 29.5 | 4.19 | 9.74 | 5.4 | 2.12 |  | 33 | 31 |
| 5 | 7/5/2005 | 29.2 | 5.55 | 10.06 | 5.6 | 5.38 |  | 6.1 | 5 |
| 6 | 7/5/2005 | 27 | 6.12 | 0.05 | 0 | 7.51 | 7.33 | 350 | 238 |
| 7 | 7/5/2005 | 29.2 | 4.62 | 2.12 | 1.1 | 7.25 | 6.65 | 11 | 10 |
| 8 | 7/5/2005 |  |  |  |  |  |  |  |  |
| 9 | 7/5/2005 | 28.1 |  |  |  |  |  | 79 | 20 |
| 10 | 7/5/2005 | 28.5 | 7.32 | 7.95 | 4.4 | 39.6 | 7.43 | 130 | 42 |
| 1 | 7/12/2005 | 27.7 | 4.18 | 9.53 | 5.3 | 11 | 6.96 | 22 | 20 |
| 2 | 7/12/2005 | 28 | 3.87 | 11.88 | 6.7 | 11.5 | 7.09 | 79 | 20 |

| Site | Date | Water Temp | Diss Oxy | Spec Cond | Salinity | Turbidity | pH | Fecal Coliform | Enterococci |
|---|---|---|---|---|---|---|---|---|---|
| 3 | 7/12/2005 | 28.4 | 5.02 | 10.02 | 5.6 | 7.36 | 7.58 | 14 | 10 |
| 4 | 7/12/2005 | 27.7 | 5.18 | 9.7 | 5.4 | 9.17 | 7.22 | 4.5 | 5 |
| 5 | 7/12/2005 | 28.4 | 3.75 | 9.19 | 5.1 | 7.49 | 7.06 | 2 | 10 |
| 6 | 7/12/2005 | 26.3 | 5.86 | 0.04 | 0 | 7.54 | 6.55 | 110 | 164 |
| 7 | 7/12/2005 | 28.1 | 4.13 | 0.98 | 0.5 | 8.56 | 6.51 | 13 | 20 |
| 8 | 7/12/2005 | 28.2 | 3.7 | 2.73 | 1.4 | 7.83 | 6.07 | 79 | 53 |
| 9 | 7/12/2005 | 28.8 | 6.7 | 4.45 | 2.4 | 35 | 6.37 | 33 | 20 |
| 10 | 7/12/2005 | 29.5 | 6.67 | 5.87 | 3.2 | 8.31 | 6.88 | 23 | 10 |
| 1 | 7/20/2005 | 29.8 | 6.2 | 9.32 | 5.2 | 12.8 | 6.88 | 4.5 | 31 |
| 2 | 7/20/2005 | 29.4 | 5.95 | 9.59 | 5.3 | 6.15 | 6.86 | 17 | 5 |
| 3 | 7/20/2005 | 29.5 | 5.7 | 9.36 | 5.2 | 2.75 | 6.92 | 79 | 5 |
| 4 | 7/20/2005 | 29.3 | 5.96 | 9.3 | 5.2 | 2.74 | 6.95 | 6.8 | 10 |
| 5 | 7/20/2005 | 29.4 | 6.1 | 8.59 | 4.8 | 4.04 | 7.27 | 7.8 | 5 |
| 6 | 7/18/2005 | 26 | 6.47 | 0.04 | 0 | 0 | 6.64 | 170 | 222 |
| 7 | 7/18/2005 | 28.9 | 3.46 | 0.58 | 0.3 | 11 | 6.51 | 49 | 42 |
| 8 | 7/18/2005 | 30 | 4.33 | 3.22 | 1.7 | 6.04 | 6.35 | 33 | 64 |
| 9 | 7/18/2005 | 30 | 6.83 | 4.13 | 2.2 | 13 | 6.9 | 33 | 31 |
| 10 | 7/18/2005 | 30.1 | 7.02 | 6.45 | 3.5 | 6.41 | 7.31 | 33 | 10 |
| 1 | 7/19/2005 | 29.8 | 5.52 | 9.46 | 5.3 | 13.9 | 6.91 | 46 | 42 |
| 2 | 7/19/2005 | 5.52 | 4.9 | 9.44 | 5.3 | 7.82 | 6.77 | 7.8 | 5 |
| 3 | 7/19/2005 | 4.9 | 5.46 | 9.19 | 5.1 | 3.29 | 6.89 | 33 | 20 |
| 4 | 7/19/2005 | 28.9 | 5.66 | 9 | 5 | 4.33 | 6.85 | 23 | 10 |
| 5 | 7/19/2005 | 28.9 | 6.64 | 8.37 | 4.6 | 15.5 | 7.07 | 13 | 5 |
| 6 | 7/19/2005 | 26 | 6.35 | 0.04 | 0 | 10.1 | 6.64 | 280 | 99 |
| 7 | 7/19/2005 | 29.1 | 3.5 | 0.75 | 0.04 | 10 | 6.44 | 23 | 31 |
| 8 | 7/19/2005 | 30.4 | 4.35 | 3.28 | 1.7 | 5.61 | 6.35 | 33 | 20 |
| 9 | 7/19/2005 | 30.3 | 6.77 | 4.58 | 2.4 | 2.67 | 6.34 | 1 | 5 |
| 10 | 7/19/2005 | 30.2 | 7.09 | 6.9 | 3.8 | 5.03 | 7.33 | 14 | 10 |
| 1 | 7/26/2005 | 32.4 | 3.35 | 9.18 | 5.1 | 6.23 | 6.71 | 70 | 20 |
| 2 | 7/26/2005 | 31.9 | 3.57 | 9.6 | 5.3 | 3.01 | 7.08 | 17 | 10 |
| 3 | 7/26/2005 | 31.4 | 5.01 | 9.5 | 5.3 | 2.34 | 7.35 | 1 | 5 |
| 4 | 7/26/2005 | 31.4 | 3.98 | 9.43 | 5.2 | 2.76 | 6.85 | 4.5 | 10 |

| Site | Date | Water Temp | Diss Oxy | Spec Cond | Salinity | Turbidity | pH | Fecal Coliform | Enterococci |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 7/26/2005 | 30.3 | 3.77 | 8.62 | 4.8 | 1.61 | 7.08 | 2 | 10 |
| 6 | 7/26/2005 | 27.5 | 5.84 | 0.05 | 0 | 8.67 | 6.97 | 240 | 164 |
| 7 | 7/26/2005 | 30.6 | 1.73 | 1.22 | 0.6 | 9.3 | 6.34 | 13 | 10 |
| 8 | 7/26/2005 | 31.3 | 3.91 | 3.43 | 1.8 | 6.68 | 6.33 | 31 | 42 |
| 9 | 7/26/2005 | 31.4 | 6.1 | 4.37 | 2.3 | 2.74 | 6.21 | 1 | 5 |
| 10 | 7/26/2005 | 31.6 | 5.58 | 6.75 | 3.7 | 3.66 | 6.91 | 2 | 10 |
| 1 | 8/2/2005 | 31.5 | 5.25 | 8.43 | 4.6 | 11.7 | 6.67 | 79 | 344 |
| 2 | 8/2/2005 | 30.3 | 5.73 | 8.83 | 4.9 | 8.85 | 6.95 | 350 | 659 |
| 3 | 8/2/2005 | 30.2 | 5.89 | 8.62 | 4.8 | 15.8 | 7.08 | 1700 | 1091 |
| 4 | 8/2/2005 | 30.5 | 4.78 | 8.88 | 4.8 | 17.9 | 7.01 | 1700 | 2005 |
| 5 | 8/2/2005 | 28.8 | 4.85 | 9.2 | 5.1 | 7.51 | 6.97 | 79 | 42 |
| 6 | 8/2/2005 | 25 | 6.56 | 0.04 | 0 | 21.6 | 6.89 | 1600 | 1184 |
| 7 | 8/2/2005 | 29.4 | 2.07 | 1.15 | 0.6 | 9.11 | 6.22 | 49 | 64 |
| 8 | 8/2/2005 | 29.5 | 3.25 | 3.41 | 1.8 | 9.58 | 6 | 49 | 75 |
| 9 | 8/2/2005 | 28.4 | 6.53 | 4.27 | 2.3 | 13.8 | 6.29 | 110 | 10 |
| 10 | 8/2/2005 | 29 | 5.9 | 6.34 | 3.4 | 8.31 | 6.68 | 33 | 137 |
| 1 | 8/9/2005 | 31.8 | 5.66 | 5.81 | 3.1 | 9.42 | 6.53 | 33 | 31 |
| 2 | 8/9/2005 | 31.7 | 5.65 | 7.22 | 3.9 | 4.72 | 5.86 | 13 | 5 |
| 3 | 8/9/2005 | 31.5 | 6.55 | 8.1 | 4.4 | 4.66 | 6.51 | 14 | 10 |
| 4 | 8/9/2005 | 31.1 | 5.64 | 8.27 | 4.5 | 8.13 | 6.51 | 33 | 5 |
| 5 | 8/9/2005 | 29.4 | 6.24 | 10.12 | 5.7 | 14.3 | 7.5 | 4.5 | 5 |
| 6 | 8/9/2005 | 25.5 | 5.62 | 0.05 | 0 | 11.1 | 7.13 | 240 | 271 |
| 7 | 8/9/2005 | 28.6 | 3.03 | 0.65 | 0.3 | 9.6 | 6.47 | 17 | 31 |
| 8 | 8/9/2005 | 29 | 2.9 | 3.49 | 1.8 | 7.08 | 6.14 | 79 | 20 |
| 9 | 8/9/2005 | 29.2 | 6 | 4.8 | 2.6 | 7.66 | 6.4 | 7.8 | 5 |
| 10 | 8/9/2005 | 29.6 | 5.49 | 5.95 | 3.2 | 8.27 | 6.87 | 11 | 20 |
| 1 | 8/16/2005 | 30.9 | 5.23 | 5.91 | 3.2 | 15.9 | 6.38 | 130 | 31 |
| 2 | 8/16/2005 | 30.6 | 5.08 | 6.94 | 3.8 | 10.3 | 6.34 | 13 | 10 |
| 3 | 8/16/2005 | 30.6 | 5.61 | 6.39 | 3.4 | 5.82 | 6.75 | 23 | 5 |
| 4 | 8/16/2005 | 31 | 5.35 | 7.33 | 4 | 4.88 | 6.5 | 49 | 20 |
| 5 | 8/16/2005 | 30.8 | 4.8 | 8.67 | 4.8 | 2.6 | 7.01 | 2 | 5 |
| 6 | 8/16/2005 | 26.7 | 6.44 | 0.05 | 0 | 11.1 | 7.42 | 130 | 87 |

| Site | Date | Water Temp | Diss Oxy | Spec Cond | Salinity | Turbidity | pH | Fecal Coliform | Enterococci |
|---|---|---|---|---|---|---|---|---|---|
| 7 | 8/16/2005 | 30.2 | 3.81 | 2.35 | 1.2 | 6.28 | 6.34 | 4.5 | 10 |
| 8 | 8/16/2005 | 31.1 | 3.45 | 6.29 | 3.4 | 15.8 | 6.21 | 79 | 10 |
| 9 | 8/16/2005 | 30.5 | 6.96 | 7.04 | 3.8 | 4.61 | 6.51 | 2 | 5 |
| 10 | 8/16/2005 | 31.2 | 7.45 | 6.73 | 3.6 | 4.77 | 7.1 | 23 | 10 |
| 1 | 8/23/2005 | 31.8 | 4.92 | 6.82 | 3.7 | 17.4 | 6.59 | 140 | 150 |
| 2 | 8/23/2005 | 32 | 4.92 | 8.93 | 4.9 | 10.5 | 6.63 | 33 | 20 |
| 3 | 8/23/2005 | 32 | 5.21 | 9.74 | 5.4 | 6.78 | 7.02 | 23 | 10 |
| 4 | 8/23/2005 | 31.5 | 4.35 | 9.91 | 5.5 | 4.47 | 6.98 | 7.8 | 10 |
| 5 | 8/23/2005 | 30.6 | 5.13 | 9.41 | 5.2 | 7.49 | 7.54 | 13 | 5 |
| 6 | 8/23/2005 | 26.5 | 5.97 | 0.04 | 0 | 12.3 | 7.13 | 350 | 192 |
| 7 | 8/23/2005 | 31 | 4.79 | 3.62 | 1.9 | 4.97 | 6.39 | 7.8 | 20 |
| 8 | 8/23/2005 | 31.5 | 3.11 | 6.27 | 3.4 | 8.87 | 6.16 | 33 | 53 |
| 9 | 8/23/2005 | 30.5 | 6.25 | 6.73 | 3.7 | 4.2 | 6.26 | 2 | 5 |
| 10 | 8/23/2005 | 31.1 | 6.29 | 7.54 | 4.1 | 4.77 | 6.94 | 13 | 20 |
| 1 | 9/27/2005 | | | | | | | | |
| 2 | 9/27/2005 | | | | | | | | |
| 3 | 9/27/2005 | | | | | | | | |
| 4 | 9/27/2005 | | | | | | | | |
| 5 | 9/27/2005 | | | | | | | | |
| 6 | 9/27/2005 | 28.9 | 4.45 | 0.05 | 0 | 7.43 | 6.48 | 130 | 104 |
| 7 | 9/27/2005 | 31.9 | 1.54 | 4.64 | 2.5 | 14.9 | 6.33 | 230 | 184 |
| 8 | 9/27/2005 | 30 | 3.99 | 9.64 | 5.4 | 11.8 | 6.88 | 80 | 80 |
| 9 | 9/27/2005 | | | | | | | | |
| 10 | 9/27/2005 | 29.5 | 5.49 | 17.73 | 10.4 | 7.7 | 7.21 | 0 | 0 |
| 1 | 10/4/2005 | 27 | | 12.42 | 7.1 | 62.3 | | 13 | 30 |
| 2 | 10/4/2005 | 26.8 | 6.21 | 12.34 | 7 | 105 | | 300 | 200 |
| 3 | 10/4/2005 | 27.5 | 6.6 | 12.7 | 7.2 | 20.3 | | 30 | 30 |
| 4 | 10/4/2005 | 27.4 | 5.26 | 12.65 | 7.2 | 8.2 | | 50 | 5 |
| 5 | | | | | | | | | |
| 11 | 10/4/2005 | 27.8 | 5.56 | 11.98 | 6.8 | 21 | | 50 | 130 |
| 6 | 10/4/2005 | 25.3 | 5.67 | 0.05 | 0 | 7.01 | 6.85 | 230 | 30 |
| 7 | 10/4/2005 | 27.7 | 2.56 | 4.26 | 2.3 | 7.19 | 6.68 | 80 | 30 |

| Site | Date | Water Temp | Diss Oxy | Spec Cond | Salinity | Turbidity | pH | Fecal Coliform | Enterococci |
|---|---|---|---|---|---|---|---|---|---|
| 8 | 10/4/2005 | 28.1 | 6 | 10.65 | 6 | 7.65 | 7.01 | 80 | 200 |
| 9 | 10/4/2005 | | | | | | | | |
| 10 | 10/4/2005 | 28.4 | 7.55 | 14.75 | 8.5 | | 7.59 | 23 | 100 |
| 1 | 10/11/2005 | 23.8 | 6.19 | 10.77 | 6.1 | 44.2 | | 50 | 6 |
| 2 | 10/11/2005 | 24.1 | 6.45 | 10.13 | 5.7 | 45.3 | | 23 | 18 |
| 3 | 10/11/2005 | 24.7 | 7.86 | 11.03 | 6.3 | 14.1 | | 7 | 1 |
| 4 | 10/11/2005 | 24.5 | 7.35 | 11.57 | 6.6 | 12.9 | | 4 | 2 |
| 5 | | | | | | | | | |
| 11 | 10/11/2005 | 24.4 | 4.4 | 12.1 | 6.9 | 5.53 | | 17 | 112 |
| 6 | 10/11/2005 | 21.6 | 6.66 | 0.05 | 0 | | 7.63 | 170 | 110 |
| 7 | 10/11/2005 | 24.2 | 3.91 | 6.19 | 3.4 | | 6.69 | 13 | 20 |
| 8 | 10/11/2005 | 24.5 | 6.83 | 12.81 | 7.4 | | 7.07 | 8 | 8 |
| 9 | 10/11/2005 | | | | | | | | |
| 10 | 10/11/2005 | 24.9 | 8.03 | 13.09 | 7.5 | | 7.54 | 4 | 1 |
| 1 | 10/18/2005 | 23.5 | 6.47 | 10.8 | 6.1 | 30.3 | | 30 | 8 |
| 2 | 10/18/2005 | 23.3 | 7.09 | 12.1 | 6.9 | 12.8 | | 11 | 2 |
| 3 | 10/18/2005 | 24.5 | 6.69 | 13.7 | 7.9 | 8.17 | | 1 | 1 |
| 4 | 10/18/2005 | 23.6 | 3.92 | 12.16 | 7 | 3.04 | | 2 | 2 |
| 5 | | | | | | | | | |
| 11 | 10/18/2005 | 24.6 | 6.3 | 14.47 | 8.4 | 5.01 | | 17 | 4 |
| 6 | 10/18/2005 | 19.7 | 6.96 | 0.05 | 0 | 7.23 | 7.85 | 50 | 28 |
| 7 | 10/18/2005 | 23.9 | 7.46 | 7.19 | 4 | 6.07 | 7.04 | 8 | 6 |
| 8 | 10/18/2005 | 24.1 | 5.71 | 11.78 | 6.7 | 8.75 | 7.06 | 1 | 14 |
| 9 | 10/18/2005 | | | | | | | | |
| 10 | 10/18/2005 | 24.6 | 8.01 | 13.17 | 7.6 | 11.6 | 7.76 | 1 | 4 |
| 1 | 10/25/2005 | 16.4 | 8.31 | 9.97 | 5.6 | 50 | | 70 | 36 |
| 2 | 10/25/2005 | 17.3 | 7.88 | 12.28 | 7.1 | 70.9 | | 8 | 1 |
| 3 | 10/25/2005 | 17.1 | 8.74 | 12.94 | 7.5 | 35.9 | | 500 | 150 |
| 4 | 10/25/2005 | 18.5 | 7.62 | 13.3 | 7.7 | 17.5 | | 170 | 54 |
| 5 | | | | | | | | | |
| 11 | 10/25/2005 | | 6.54 | 12.45 | 7.2 | 3.02 | | 50 | 1 |
| 6 | 10/25/2005 | 15.4 | 7.96 | 0.05 | 0 | 6.03 | | 230 | 52 |

| Site | Date | Water Temp | Diss Oxy | Spec Cond | Salinity | Turbidity | pH | Fecal Coliform | Enterococci |
|---|---|---|---|---|---|---|---|---|---|
| 7 | 10/25/2005 | 14.2 | 4.53 | 5.6 | 3 | 15.8 | | 510 | 50 |
| 8 | 10/25/2005 | 19.6 | 7.18 | 10.94 | 6.2 | 7.14 | | 300 | 8 |
| 9 | 10/25/2005 | | | | | | | | |
| 10 | 10/25/2005 | 19 | 8.79 | 13.88 | 8.1 | 65 | | 30 | 8 |
| 1 | 11/1/2005 | 18.4 | 8.37 | 12.47 | 7.2 | 27.6 | | 80 | 2 |
| 2 | 11/1/2005 | 18.6 | 8.38 | 14.71 | 8.6 | 7.25 | | 7 | 4 |
| 3 | 11/1/2005 | 18.5 | 8.47 | 15 | 8.8 | 11.3 | | 13 | 0 |
| 4 | 11/1/2005 | 18.3 | 7.95 | 15.13 | 8.8 | 6.82 | | 23 | 26 |
| 5 | | | | | | | | | |
| 11 | 11/1/2005 | 18.8 | 7.13 | 14.04 | 8.2 | 3.97 | | 230 | 28 |
| 6 | 11/1/2005 | 16.9 | 7.98 | 0.05 | 0 | 5.6 | | 300 | 32 |
| 7 | 11/1/2005 | 18.7 | 7.65 | 7.77 | 4.3 | 7.25 | | 50 | 10 |
| 8 | 11/1/2005 | 18.8 | 7.99 | 9.47 | 5.3 | 5.13 | | | |
| 9 | 11/1/2005 | | | | | | | | |
| 10 | 11/1/2005 | 18.9 | 8.19 | 13.99 | 8.1 | 14.7 | | | |
| 1 | 11/8/2005 | 20.3 | 6.57 | 11.99 | 6.9 | 3.85 | | 30 | 36 |
| 2 | 11/8/2005 | 20.8 | 6.26 | 11.28 | 7 | 4.78 | | 500 | 30 |
| 3 | 11/8/2005 | 20.1 | | 12.43 | 7.1 | 2.54 | | 14 | 10 |
| 4 | 11/8/2005 | 20.4 | 7.59 | 12.33 | 7.1 | 2.29 | | 4 | 8 |
| 5 | | | | | | | | | |
| 11 | 11/8/2005 | 23.3 | 5.6 | 14.14 | 8.2 | 7.38 | | 80 | 66 |
| 6 | 11/8/2005 | 21 | 6.93 | 0.06 | 0 | 5.25 | | 500 | 32 |
| 7 | 11/8/2005 | 21.9 | 9.63 | 6.85 | 4.1 | 6.36 | | 130 | 4 |
| 8 | 11/8/2005 | 21.2 | 8.11 | 9.75 | 5.5 | 6.4 | | 50 | 10 |
| 9 | 11/8/2005 | | | | | | | | |
| 10 | 11/8/2005 | 23.1 | 8.69 | 14.41 | 8.4 | 4.62 | | 9 | 4 |
| 1 | 11/15/2005 | 21.4 | 6.05 | 11.75 | 6.7 | 4.03 | | 50 | 16 |
| 2 | 11/15/2005 | 20.5 | 6.41 | 13.09 | 7.6 | 4.05 | | 80 | 16 |
| 3 | 11/15/2005 | 20.7 | 7.37 | 14.67 | 8.5 | 4.1 | | 11 | 8 |
| 4 | 11/15/2005 | 20.4 | 5.7 | 14.36 | 8.3 | 3.09 | | 0 | 4 |
| 5 | 11/15/2005 | 23.1 | 3.15 | 13.33 | 7.7 | 3.88 | | 500 | 500 |
| 6 | 11/15/2005 | 20.9 | 7.87 | 0.05 | 0 | | | 1600 | 72 |

| Site | Date | Water Temp | Diss Oxy | Spec Cond | Salinity | Turbidity | pH | Fecal Coliform | Enterococci |
|---|---|---|---|---|---|---|---|---|---|
| 7 | 11/15/2005 | 21.8 | 8.43 | 8.52 | 4.8 | 4.07 | | 23 | 10 |
| 8 | 11/15/2005 | 21.8 | 7.49 | 12.01 | 6.9 | 5.37 | | 80 | 50 |
| 9 | 11/15/2005 | | | | | | | | |
| 10 | 11/15/2005 | 23.3 | 8.21 | 15.19 | 8.9 | | | 30 | 16 |
| 1 | 11/22/2005 | 13.4 | 8.68 | 11.48 | 6.6 | 55.9 | | 30 | 8 |
| 2 | 11/22/2005 | 13.7 | 8.47 | 11.97 | 6.9 | 36.5 | | 11 | 6 |
| 3 | 11/22/2005 | 13.9 | 9.75 | 13.39 | 7.1 | 46.9 | | 50 | 6 |
| 4 | 11/22/2005 | 13.9 | 9.4 | 12.75 | 7.4 | 20.9 | | 4 | 10 |
| 5 | 11/22/2005 | 14.3 | 6.31 | 13.46 | 7.8 | 1.31 | | 30 | 54 |
| 6 | 11/22/2005 | 12.7 | 8.57 | 0.05 | 0 | 9.43 | | 230 | 80 |
| 7 | 11/22/2005 | 15.2 | 8.67 | 6.99 | 3.9 | 9.85 | | 130 | 10 |
| 8 | 11/22/2005 | 14.3 | 8.97 | 11.4 | 6.5 | 9.95 | | 50 | 20 |
| 9 | 11/22/2005 | | | | | | | | |
| 10 | 11/22/2005 | 16.1 | 9.09 | 14.45 | 8.4 | | | 30 | 0 |
| 1 | 11/29/2005 | 16 | 7.7 | 11.51 | 6.6 | 42.7 | | 30 | 6 |
| 2 | 11/29/2005 | 15.7 | 8.05 | 12.17 | 7 | 18.1 | | 300 | 82 |
| 3 | 11/29/2005 | 15.7 | 8.95 | 11.15 | 7.2 | 22.6 | | 1100 | 112 |
| 4 | 11/29/2005 | 15.3 | 8.35 | 13.16 | 7.6 | 13 | | 700 | 94 |
| 5 | 11/29/2005 | 16.7 | 6.03 | 13.44 | 7.8 | 1.63 | | 50 | 18 |
| 6 | 11/29/2005 | 15.9 | 7.59 | 0.05 | 0 | 22.6 | | 300 | 300 |
| 7 | 11/29/2005 | 16.3 | 8.68 | 7.58 | 4.2 | 5.97 | | 170 | 190 |
| 8 | 11/29/2005 | 17.1 | 6.41 | 8.11 | 4.5 | 8.71 | | 500 | 150 |
| 9 | 11/29/2005 | | | | | | | | |
| 10 | 11/29/2005 | 16.7 | 8.56 | 20.13 | 12.1 | 18.5 | | 70 | 4 |
| 1 | 12/6/2005 | 12.4 | 9.35 | 11.13 | 6.4 | 95.3 | | 130 | 98 |
| 2 | 12/6/2005 | 12.9 | 9.28 | 11.51 | 6.6 | 79.5 | | 80 | 14 |
| 3 | 12/6/2005 | 12.9 | 9.22 | 11.83 | 6.8 | 23.2 | | 50 | 50 |
| 4 | 12/6/2005 | 12.4 | 9.48 | 12.22 | 7 | 21.2 | | 80 | 16 |
| 5 | 12/6/2005 | | | | | | | | |
| 11 | 12/6/2005 | 12.9 | 5.28 | 12.76 | 7.4 | 1.95 | | 30 | 12 |
| 6 | 12/6/2005 | 11.9 | 8.45 | 0.05 | 0 | | | 3000 | 84 |
| 7 | 12/6/2005 | 12.8 | 8.82 | 6.35 | 3.5 | 4.79 | | 130 | 41 |

| Site | Date | Water Temp | Diss Oxy | Spec Cond | Salinity | Turbidity | pH | Fecal Coliform | Enterococci |
|---|---|---|---|---|---|---|---|---|---|
| 8 | 12/6/2005 | 14 | 7.97 | 10.5 | 6 | 5.03 | | 230 | 128 |
| 9 | 12/6/2005 | | | | | | | | |
| 10 | 12/6/2005 | 13.3 | 9.69 | 16.71 | 9.9 | 12.5 | | 30 | 8 |
| 1 | 12/13/2005 | 11.5 | 10.44 | 11.42 | 6.5 | 5.71 | | 30 | 4 |
| 2 | 12/13/2005 | 11.4 | 6.64 | 12.09 | 6.9 | 10.9 | | 50 | 4 |
| 3 | 12/13/2005 | 11.3 | 10.26 | 12.01 | 6.9 | 5.66 | | 23 | 0 |
| 4 | 12/13/2005 | 11.3 | 9.36 | 12.51 | 7.2 | 5.08 | | 8 | 0 |
| 5 | 12/13/2005 | | | | | | | | |
| 11 | 12/13/2005 | 11.4 | 10.24 | 13.36 | 7.7 | 5.91 | | 14 | 4 |
| 6 | 12/13/2005 | 10.9 | 8.95 | 0.05 | 0 | 4.94 | | 170 | 12 |
| 7 | 12/13/2005 | 12.4 | 7.27 | 4.82 | 2.6 | 10.6 | | 30 | 2 |
| 8 | 12/13/2005 | 12.5 | 9.81 | 12.01 | 6.9 | 3.81 | | 50 | 4 |
| 9 | 12/13/2005 | | | | | | | | |
| 10 | 12/13/2005 | 15.4 | 9.48 | 14.91 | 8.7 | 21.9 | | 7 | 2 |

# Appendix B: EPA data

Fecal Coliform Data from EPA's STORET Katrina Central Data Warehouse (*http://oaspub.epa.gov/storetkp/dw*)

## Orleans Parish water fecal coliforms

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| LP-0004 | 30.10855 | -89.7897 | NAD83 | OSVBOLD3 | 10/14/2005 0:00 | | | *Non-detect | |
| LP-0002 | 30.170883 | -89.752317 | NAD83 | OSVBOLD3 | 10/14/2005 0:00 | | | *Non-detect | |
| LP-0023 | 30.181117 | -89.816133 | NAD83 | OSVBOLD3 | 10/14/2005 0:00 | | Actual | *Non-detect | |
| LP-0018 | 30.26925 | -90.029367 | NAD83 | OSVBOLD3 | 10/14/2005 0:00 | | Actual | *Non-detect | |
| LP-0015 | 30.170733 | -89.704017 | NAD83 | OSVBOLD3 | 10/14/2005 0:00 | | Actual | *Non-detect | |
| LP-0007 | 30.302133 | -89.996433 | NAD83 | OSVBOLD3 | 10/14/2005 0:00 | | Actual | *Non-detect | |
| LP-0007 | 30.302133 | -89.996433 | NAD83 | OSVBOLD3 | 10/14/2005 0:00 | | Actual | *Non-detect | |
| LP-0029 | 30.07505 | -90.1347 | NAD83 | OSVBOLD3 | 10/13/2005 0:00 | | Actual | 4 | MPN/100ml |
| LP-0028 | 30.079833 | -90.35615 | NAD83 | OSVBOLD3 | 10/13/2005 0:00 | | Actual | 10 | MPN/100ml |
| LP-0024 | 30.1771 | -90.334933 | NAD83 | OSVBOLD3 | 10/13/2005 0:00 | | Actual | *Non-detect | |
| LP-0021 | 30.111067 | -90.060733 | NAD83 | OSVBOLD3 | 10/13/2005 0:00 | | Actual | 2 | MPN/100ml |
| LP-0020 | 30.058467 | -90.190617 | NAD83 | OSVBOLD3 | 10/13/2005 0:00 | | Actual | 8 | MPN/100ml |
| LP-0016 | 30.080833 | -90.301133 | NAD83 | OSVBOLD3 | 10/13/2005 0:00 | | Actual | 4 | MPN/100ml |
| LP-0016 | 30.080833 | -90.301133 | NAD83 | OSVBOLD3 | 10/13/2005 0:00 | | Actual | 6 | MPN/100ml |
| LP-0013 | 30.112967 | -90.143683 | NAD83 | OSVBOLD3 | 10/13/2005 0:00 | | Actual | *Non-detect | |
| LP-0012 | 30.108433 | -90.252317 | NAD83 | OSVBOLD3 | 10/13/2005 0:00 | | Actual | 12 | MPN/100ml |
| LP-0008 | 30.09575 | -90.358417 | NAD83 | OSVBOLD3 | 10/13/2005 0:00 | | Actual | *Non-detect | |
| LP-0026 | 30.227017 | -90.278083 | NAD83 | OSVBOLD3 | 10/12/2005 0:00 | | Actual | *Non-detect | |
| LP-0019 | 30.183067 | -90.214433 | NAD83 | OSVBOLD3 | 10/12/2005 0:00 | | Actual | 1 | MPN/100ml |
| LP-0014 | 30.332167 | -90.183833 | NAD83 | OSVBOLD3 | 10/12/2005 0:00 | | Actual | 1 | MPN/100ml |
| LP-0003 | 30.217483 | -90.21225 | NAD83 | OSVBOLD3 | 10/12/2005 0:00 | | | *Non-detect | |
| LP-0030 | 30.298383 | -90.2 | NAD83 | OSVBOLD3 | 10/12/2005 0:00 | | Actual | *Non-detect | |
| LP-0027 | 30.311633 | -90.09805 | NAD83 | OSVBOLD3 | 10/12/2005 0:00 | | Actual | 3 | MPN/100ml |
| LP-0026 | 30.227017 | -90.278083 | NAD83 | OSVBOLD3 | 10/12/2005 0:00 | | Actual | *Non-detect | |
| LP-0022 | 30.331333 | -90.262367 | NAD83 | OSVBOLD3 | 10/12/2005 0:00 | | Actual | 4 | MPN/100ml |
| LP-0011 | 30.139667 | -90.219783 | NAD83 | OSVBOLD3 | 10/12/2005 0:00 | | Actual | 1 | MPN/100ml |
| LP-0006 | 30.244317 | -90.258417 | NAD83 | OSVBOLD3 | 10/12/2005 0:00 | | Actual | 1 | MPN/100ml |
| LP-0009 | 30.226333 | -90.10315 | NAD83 | OSVBOLD3 | 10/11/2005 0:00 | | Actual | *Non-detect | |
| LP-0001 | 30.165817 | -90.030217 | NAD83 | OSVBOLD3 | 10/11/2005 0:00 | | | *Non-detect | |
| LP-0025 | 30.232417 | -90.065167 | NAD83 | OSVBOLD3 | 10/11/2005 0:00 | | Actual | 4 | MPN/100ml |

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| LP-0017 | 30.1155 | -89.941667 | NAD83 | OSVBOLD3 | 10/11/2005 0:00 | | Actual | 2 | MPN/100ml |
| LP-0010 | 30.22095 | -89.950483 | NAD83 | OSVBOLD3 | 10/11/2005 0:00 | | Actual | 2 | MPN/100ml |
| LP-0005 | 30.202467 | -90.0188 | NAD83 | OSVBOLD3 | 10/11/2005 0:00 | | Actual | 1 | MPN/100ml |
| LP-0005 | 30.202467 | -90.0188 | NAD83 | OSVBOLD3 | 10/11/2005 0:00 | | Actual | 1 | MPN/100ml |
| 11376 | 30.009285 | -89.97991 | NAD83 | 22201 | 11/5/2005 15:25 | T0630-051105-03 | Actual | 135 | cfu/100ml |
| 11377 | 30.009745 | -89.977305 | NAD83 | 22202 | 11/5/2005 15:45 | T0630-051105-04 | Actual | 126 | cfu/100ml |
| 11375 | 30.00933 | -89.978316 | NAD83 | 22200 | 11/5/2005 15:00 | T0630-051105-02 | Estimated | 390 | cfu/100ml |
| 11374 | 30.01017 | -89.964415 | NAD83 | 22199 | 11/5/2005 14:10 | T0630-051105-01 | Estimated | 200 | cfu/100ml |
| 11378 | 30.008701 | -89.988171 | NAD83 | 22203 | 11/5/2005 16:10 | T0630-051105-05 | Estimated | 81 | cfu/100ml |
| 11061 | 29.986845 | -90.044836 | NAD83 | 20706 | 10/22/2005 9:34 | T0726-051022-01 | Actual | 3900 | cfu/100ml |
| 11044 | 29.985956 | -90.045468 | NAD83 | 20651 | 10/21/2005 9:45 | T0726-051021-01 | Actual | 1300 | cfu/100ml |
| 11021 | 29.986836 | -90.044785 | NAD83 | 20562 | 10/20/2005 9:17 | T0335-051020-01 | Actual | 6727 | cfu/100ml |
| 10919 | 29.985908 | -90.045408 | NAD83 | 20536 | 10/19/2005 9:40 | T0335-051019-01 | Actual | 664 | cfu/100ml |
| 10866 | 29.98677 | -90.04473 | NAD83 | 20324 | 10/18/2005 9:45 | T0335-051018-01 | Actual | 764 | cfu/100ml |
| 10834 | 29.985998 | -90.045308 | NAD83 | 20190 | 10/17/2005 9:59 | T0335-051017-01 | Actual | 3800 | cfu/100ml |
| 10813 | 29.98687 | -90.044891 | NAD83 | 1673 | 10/16/2005 10:25 | T0335-051016-01 | Estimated | 62000 | cfu/100ml |
| 10809 | 29.985965 | -90.045428 | NAD83 | 1672 | 10/15/2005 15:33 | T0335-051015-13 | Actual | 76000 | cfu/100ml |
| 10770 | 30.05868 | -89.966296 | NAD83 | 1468 | 10/14/2005 10:00 | T0054-051014-01 | Estimated | 180 | cfu/100ml |
| 10772 | 29.986761 | -90.044891 | NAD83 | 1470 | 10/14/2005 12:55 | T0054-051014-03 | Actual | 37000 | cfu/100ml |
| 10771 | 29.981681 | -90.023403 | NAD83 | 1469 | 10/14/2005 11:10 | T0054-051014-02 | Actual | 50000 | cfu/100ml |
| 10743 | 29.98593 | -90.045446 | NAD83 | 1455 | 10/13/2005 11:45 | T0054-051013-04 | Actual | 18000 | cfu/100ml |
| 10740 | 30.058483 | -89.96645 | NAD83 | 1451 | 10/13/2005 10:10 | T0054-051013-01 | Actual | *Non-detect | |
| 10700 | 29.9869 | -90.0449 | NAD83 | 1823 | 10/12/2005 9:45 | T0442-051012-01 | Actual | 3000 | cfu/100ml |
| 10707 | 30.0355 | -90.0113 | NAD83 | 1831 | 10/12/2005 12:20 | T0442-051012-08 | Actual | 36 | cfu/100ml |
| 10699 | 29.981793 | -90.023225 | NAD83 | 1745 | 10/12/2005 12:50 | T0429-051012-03 | Actual | 2100 | cfu/100ml |
| 10698 | 29.975678 | -90.004216 | NAD83 | 1744 | 10/12/2005 11:45 | T0429-051012-02 | Actual | 100 | cfu/100ml |
| 10663 | 29.98686 | -90.044878 | NAD83 | 1447 | 10/11/2005 9:50 | T0054-051011-01 | Actual | 6100 | cfu/100ml |
| 10683 | 29.97563 | -90.00397 | NAD83 | 1820 | 10/11/2005 13:00 | T0442-051011-10 | Actual | 17 | cfu/100ml |
| 10682 | 29.9738 | -90.00539 | NAD83 | 1819 | 10/11/2005 12:00 | T0442-051011-09 | Actual | *Non-detect | |
| 10665 | 29.98008 | -90.02015 | NAD83 | 1449 | 10/11/2005 12:10 | T0054-051011-03 | Actual | 200 | cfu/100ml |
| 10666 | 30.058643 | -89.966211 | NAD83 | 1450 | 10/11/2005 14:00 | T0054-051011-04 | Actual | 50 | cfu/100ml |
| 10628 | 29.97556 | -90.004003 | NAD83 | 1805 | 10/10/2005 12:05 | T0442-051010-01 | Actual | *Non-detect | |
| 10614 | 30.058661 | -89.966468 | NAD83 | 1434 | 10/10/2005 12:40 | T0054-051010-02 | Actual | 27 | cfu/100ml |
| 10632 | 29.98075 | -90.02011 | NAD83 | 1810 | 10/10/2005 15:29 | T0442-051010-05 | Actual | *Present >QL | |
| 10630 | 29.975536 | -90.003793 | NAD83 | 1808 | 10/10/2005 14:15 | T0442-051010-03 | Actual | 1200 | cfu/100ml |
| 10613 | 29.985866 | -90.045421 | NAD83 | 1433 | 10/10/2005 10:15 | T0054-051010-01 | Actual | 11000 | cfu/100ml |
| 10611 | 29.97992 | -90.018781 | NAD83 | 1432 | 10/9/2005 16:05 | T0054-051009-15 | Actual | 82 | cfu/100ml |
| 10610 | 29.974616 | -90.00432 | NAD83 | 1431 | 10/9/2005 15:05 | T0054-051009-14 | Actual | *Non-detect | |
| 10594 | 29.977231 | -90.011651 | NAD83 | 1804 | 10/9/2005 16:30 | T0442-051009-03 | Actual | *Non-detect | |

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| 10609 | 29.986921 | -90.04482 | NAD83 | 1430 | 10/9/2005 13:55 | T0054-051009-13 | Actual | *Present >QL | |
| 10587 | 29.976736 | -90.016516 | NAD83 | 1417 | 10/8/2005 15:15 | T0054-051008-05 | Actual | 83 | cfu/100ml |
| 10573 | 29.976721 | -90.010841 | NAD83 | 1802 | 10/8/2005 13:45 | T0442-051008-08 | Actual | 200 | cfu/100ml |
| 10586 | 29.98587 | -90.045426 | NAD83 | 1416 | 10/8/2005 13:30 | T0054-051008-04 | Actual | 6800 | cfu/100ml |
| 10585 | 29.986513 | -90.125111 | NAD83 | 1415 | 10/8/2005 12:00 | T0054-051008-03 | Actual | 5800 | cfu/100ml |
| 10566 | 30.035626 | -90.011516 | NAD83 | 1795 | 10/8/2005 10:15 | T0442-051008-01 | Actual | 100 | cfu/100ml |
| 10563 | 29.978071 | -90.01587 | NAD83 | 1793 | 10/7/2005 13:05 | T0442-051007-11 | Actual | 40 | cfu/100ml |
| 10552 | 29.977188 | -90.013405 | NAD83 | 1412 | 10/7/2005 14:10 | T0054-051007-03 | Actual | *Present >QL | |
| 10564 | 29.980166 | -90.019358 | NAD83 | 1794 | 10/7/2005 14:20 | T0442-051007-12 | Actual | 64 | cfu/100ml |
| 10550 | 29.986878 | -90.044878 | NAD83 | 1410 | 10/7/2005 10:20 | T0054-051007-01 | Actual | 3600 | cfu/100ml |
| 10551 | 29.994541 | -90.100673 | NAD83 | 1411 | 10/7/2005 11:50 | T0054-051007-02 | Actual | 1100 | cfu/100ml |
| 10546 | 29.985766 | -90.045418 | NAD83 | 1409 | 10/6/2005 17:45 | T0054-051006-05 | Actual | *Present >QL | |
| 10542 | 30.058823 | -89.966333 | NAD83 | 1400 | 10/6/2005 10:05 | T0054-051006-01 | Actual | 27 | cfu/100ml |
| 10514 | 29.362626 | -89.562276 | NAD83 | 1781 | 10/6/2005 14:50 | T0442-051006-03 | Actual | 91 | cfu/100ml |
| 10545 | 29.973066 | -90.006506 | NAD83 | 1407 | 10/6/2005 16:45 | T0054-051006-04 | Actual | 100 | cfu/100ml |
| 10544 | 29.975601 | -90.011406 | NAD83 | 1405 | 10/6/2005 15:50 | T0054-051006-03 | Actual | *Non-detect | |
| 10432 | 29.974161 | -90.01439 | NAD83 | 18584 | 10/5/2005 14:00 | T0442-051005-06 | Actual | 300 | cfu/100ml |
| 10425 | 29.973415 | -90.011876 | NAD83 | 18553 | 10/5/2005 14:13 | T0219-051005-08 | Actual | 200 | cfu/100ml |
| 10431 | 29.986895 | -90.044888 | NAD83 | 18583 | 10/5/2005 12:55 | T0442-051005-05 | Actual | 60000 | cfu/100ml |
| 10433 | 29.98198 | -90.02393 | NAD83 | 18585 | 10/5/2005 15:45 | T0442-051005-07 | Actual | 4400 | cfu/100ml |
| 10418 | 30.046516 | -89.988681 | NAD83 | 18546 | 10/5/2005 10:20 | T0219-051005-01 | Actual | 4600 | cfu/100ml |
| 10331 | 29.973688 | -90.012878 | NAD83 | 18369 | 10/4/2005 11:40 | T0219-051004-03 | Actual | *Non-detect | |
| 10348 | 30.04668 | -89.988356 | NAD83 | 18394 | 10/4/2005 9:00 | T0335-051004-01 | Actual | 10 | cfu/100ml |
| 10329 | 29.984216 | -90.037473 | NAD83 | 18367 | 10/4/2005 9:30 | T0219-051004-01 | Actual | *Non-detect | |
| 10332 | 29.974683 | -90.017273 | NAD83 | 18370 | 10/4/2005 12:30 | T0219-051004-04 | Actual | *Non-detect | |
| 10330 | 29.981563 | -90.02374 | NAD83 | 18368 | 10/4/2005 10:00 | T0219-051004-02 | Actual | *Non-detect | |
| 10301 | 29.986793 | -90.044983 | NAD83 | 18250 | 10/3/2005 10:15 | T0219-051003-02 | Estimated | 13000 | cfu/100ml |
| 10300 | 29.988338 | -90.067525 | NAD83 | 18248 | 10/3/2005 9:00 | T0219-051003-01 | Actual | 400 | cfu/100ml |
| 10303 | 29.97369 | -90.01772 | NAD83 | 18253 | 10/3/2005 12:50 | T0219-051003-04 | Actual | 200 | cfu/100ml |
| 10303 | 29.97369 | -90.01772 | NAD83 | 18252 | 10/3/2005 12:50 | T0219-051003-04 | Actual | 90 | cfu/100ml |
| 10246 | 29.969131 | -90.005483 | NAD83 | 18108 | 10/2/2005 13:45 | T0335-051002-13 | Actual | *Non-detect | |
| 10246 | 29.969131 | -90.005483 | NAD83 | 18107 | 10/2/2005 13:45 | T0335-051002-13 | Actual | *Non-detect | |
| 10248 | 29.984215 | -90.037448 | NAD83 | 18110 | 10/2/2005 16:15 | T0335-051002-15 | Actual | 100 | cfu/100ml |
| 10247 | 29.97261 | -90.017935 | NAD83 | 18109 | 10/2/2005 14:50 | T0335-051002-14 | Actual | *Non-detect | |
| 10214 | 29.986978 | -90.044828 | NAD83 | 18003 | 10/1/2005 13:50 | T0335-051001-02 | Actual | *Non-detect | |
| 10213 | 29.967838 | -90.008003 | NAD83 | 18002 | 10/1/2005 11:30 | T0335-051001-01 | Actual | 100 | cfu/100ml |
| 10152 | 29.988548 | -90.068003 | NAD83 | 17865 | 9/30/2005 11:00 | T0335-050930-03 | Estimated | 200 | cfu/100ml |
| 10151 | 29.981826 | -90.023351 | NAD83 | 17864 | 9/30/2005 9:30 | T0335-050930-02 | Estimated | 1600 | cfu/100ml |
| 10148 | 29.967111 | -90.018495 | NAD83 | 17860 | 9/30/2005 12:01 | T0442-050930-02 | Estimated | 200 | cfu/100ml |

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| 10149 | 30.011501 | -90.119301 | NAD83 | 17861 | 9/30/2005 14:00 | T0442-050930-03 | Actual | *Non-detect | |
| 10141 | 30.058218 | -89.966783 | NAD83 | 17849 | 9/30/2005 9:50 | T0219-050930-02 | Estimated | 300 | cfu/100ml |
| 10140 | 30.03472 | -90.010603 | NAD83 | 17848 | 9/30/2005 8:30 | T0219-050930-01 | Estimated | 2200 | cfu/100ml |
| 10143 | 29.994503 | -90.100611 | NAD83 | 17852 | 9/30/2005 11:40 | T0219-050930-04 | Estimated | 900 | cfu/100ml |
| 10150 | 30.01618 | -90.06955 | NAD83 | 17862 | 9/30/2005 8:04 | T0335-050930-01 | Estimated | 700 | cfu/100ml |
| 10147 | 29.984208 | -90.037536 | NAD83 | 17858 | 9/30/2005 9:28 | T0442-050930-01 | Estimated | 4000 | cfu/100ml |
| 10061 | 30.05809 | -89.96681 | NAD83 | 17541 | 9/29/2005 10:00 | T0219-050929-03 | Actual | 1800 | cfu/100ml |
| 10059 | 29.99424 | -90.101263 | NAD83 | 17539 | 9/29/2005 7:15 | T0219-050929-01 | Actual | 1900 | cfu/100ml |
| 10085 | 29.981686 | -90.023468 | NAD83 | 17695 | 9/29/2005 9:15 | T0335-050929-02 | Actual | 500 | cfu/100ml |
| 10086 | 29.988305 | -90.067593 | NAD83 | 17696 | 9/29/2005 10:35 | T0335-050929-03 | Actual | 1000 | cfu/100ml |
| 10062 | 29.986948 | -90.044831 | NAD83 | 17542 | 9/29/2005 12:10 | T0219-050929-04 | Actual | 2500 | cfu/100ml |
| 10060 | 30.046786 | -89.988471 | NAD83 | 17540 | 9/29/2005 8:50 | T0219-050929-02 | Actual | 1000 | cfu/100ml |
| 10085 | 29.981686 | -90.023468 | NAD83 | 17694 | 9/29/2005 9:15 | T0335-050929-02 | Actual | 500 | cfu/100ml |
| 10084 | 30.01621 | -90.069575 | NAD83 | 17693 | 9/29/2005 7:50 | T0335-050929-01 | Actual | 3000 | cfu/100ml |
| 10045 | 29.994175 | -90.10086 | NAD83 | 17502 | 9/28/2005 16:45 | T0219-050928-03 | Actual | 1300 | cfu/100ml |
| 10040 | 30.016148 | -90.069373 | NAD83 | 17467 | 9/28/2005 15:00 | T0441-050928-03 | Actual | 600 | cfu/100ml |
| 10044 | 30.058215 | -89.96674 | NAD83 | 17501 | 9/28/2005 14:00 | T0219-050928-02 | Actual | 1900 | cfu/100ml |
| 10041 | 29.981465 | -90.025366 | NAD83 | 17468 | 9/28/2005 13:55 | T0335-050928-01 | Actual | 900 | cfu/100ml |
| 10039 | 29.982128 | -90.02787 | NAD83 | 17466 | 9/28/2005 13:05 | T0441-050928-02 | Actual | 400 | cfu/100ml |
| 10028 | 29.9815 | -90.02625 | NAD83 | 17422 | 9/26/2005 15:30 | SW593-GB-G-N-09 | Actual | 2200 | cfu/100ml |
| 9864 | 29.988133 | -90.067735 | WGS84 | 17232 | 9/26/2005 12:10 | SW202-KN-G-D-09 | Actual | 19000 | cfu/100ml |
| 9864 | 29.988133 | -90.067735 | WGS84 | 17231 | 9/26/2005 12:10 | SW202-KN-G-N-09 | Actual | 10000 | cfu/100ml |
| 9854 | 29.986885 | -90.044821 | WGS84 | 17215 | 9/25/2005 9:00 | SW600-gb-G-N-09 | Actual | 22000 | cfu/100ml |
| 9810 | 30.046608 | -89.98866 | WGS84 | 17193 | 9/25/2005 9:50 | SW200-KN-G-D-09 | Actual | 30000 | cfu/100ml |
| 9857 | 29.967326 | -90.020568 | WGS84 | 17218 | 9/25/2005 13:30 | SW598-gb-G-N-09 | Actual | 4800 | cfu/100ml |
| 9811 | 30.008701 | -90.10819 | WGS84 | 17194 | 9/25/2005 12:40 | SW201-KN-G-N-09 | Actual | 490000 | cfu/100ml |
| 9856 | 29.963453 | -90.021036 | WGS84 | 17217 | 9/25/2005 12:00 | SW599-gb-G-N-09 | Actual | 25000 | cfu/100ml |
| 9810 | 30.046608 | -89.98866 | WGS84 | 17192 | 9/25/2005 9:50 | SW200-KN-G-N-09 | Actual | 23000 | cfu/100ml |
| 10025 | 29.966392 | -89.99893 | NAD83 | 17419 | 9/26/2005 11:00 | SW590-GB-G-N-09 | Actual | 4300 | cfu/100ml |
| 10027 | 29.961883 | -90.00083 | NAD83 | 17421 | 9/26/2005 14:00 | SW592-GB-G-N-09 | Actual | 4400 | cfu/100ml |
| 10026 | 29.96792 | -89.99893 | NAD83 | 17420 | 9/26/2005 12:30 | SW591-GB-G-N-09 | Actual | 1400 | cfu/100ml |

## Orleans Parish sediment fecal coliforms

The units as downloaded were cfu/100 mL. These were changed to cfu/g for this report.

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| 11317 | 29.922093 | -89.9427 | NAD83 | 22122 | 11/4/2005 10:15 | T0924-051104-01 | Actual | *Non-detect | |
| 11317 | 29.922093 | -89.9427 | NAD83 | 22121 | 11/4/2005 10:15 | T0924-051104-01 | Actual | *Non-detect | |
| 10787 | 29.992123 | -90.041395 | NAD83 | 19918 | 10/14/2005 10:25 | T0335-051014-01 | Actual | 24627 | cfu/g |
| 10787 | 29.992123 | -90.041395 | NAD83 | 19919 | 10/14/2005 10:25 | T0335-051014-01 | Actual | 10499 | cfu/g |
| 9979 | 30.035516 | -89.989746 | NAD83 | 17326 | 9/27/2005 10:30 | T0232-050927-07 | Actual | *Non-detect | |
| 9993 | 30.01357 | -89.971351 | NAD83 | 17341 | 9/27/2005 13:00 | T0442-050927-09 | Actual | 26431 | cfu/g |
| 9994 | 30.030406 | -89.98506 | NAD83 | 17342 | 9/27/2005 13:28 | T0442-050927-10 | Actual | 4390 | cfu/g |
| 9984 | 30.011935 | -89.999445 | NAD83 | 17331 | 9/27/2005 12:00 | T0232-050927-12 | Actual | *Non-detect | |
| 9981 | 30.025391 | -90.001008 | NAD83 | 17328 | 9/27/2005 11:05 | T0232-050927-09 | Actual | *Present >QL | |
| 9988 | 30.040308 | -89.958715 | NAD83 | 17335 | 9/27/2005 10:50 | T0442-050927-04 | Actual | 11683 | cfu/g |
| 9986 | 30.058431 | -89.96051 | NAD83 | 17333 | 9/27/2005 9:50 | T0442-050927-02 | Actual | 2501 | cfu/g |
| 9989 | 30.03342 | -89.957681 | NAD83 | 17336 | 9/27/2005 11:10 | T0442-050927-05 | Actual | 9725 | cfu/g |
| 9990 | 30.038743 | -89.966796 | NAD83 | 17337 | 9/27/2005 11:35 | T0442-050927-06 | Actual | 3505 | cfu/g |
| 9985 | 30.070808 | -89.944141 | NAD83 | 17332 | 9/27/2005 9:15 | T0442-050927-01 | Actual | *Non-detect | |
| 9983 | 30.01282 | -89.994848 | NAD83 | 17330 | 9/27/2005 11:40 | T0232-050927-11 | Actual | *Non-detect | |
| 9982 | 30.017603 | -90.006113 | NAD83 | 17329 | 9/27/2005 11:20 | T0232-050927-10 | Actual | *Non-detect | |
| 9987 | 30.049565 | -89.962603 | NAD83 | 17334 | 9/27/2005 10:25 | T0442-050927-03 | Actual | 3377 | cfu/g |
| 9991 | 30.04637 | -89.97605 | NAD83 | 17338 | 9/27/2005 12:05 | T0442-050927-07 | Estimated | *Non-detect | |
| 9976 | 30.033878 | -90.016466 | NAD83 | 17321 | 9/27/2005 9:25 | T0232-050927-03 | Actual | *Present >QL | |
| 9979 | 30.035516 | -89.989746 | NAD83 | 17325 | 9/27/2005 10:30 | T0232-050927-07 | Actual | *Non-detect | |
| 9976 | 30.033878 | -90.016466 | NAD83 | 17322 | 9/27/2005 9:40 | T0232-050927-04 | Actual | *Present >QL | |
| 9980 | 30.026596 | -89.992233 | NAD83 | 17327 | 9/27/2005 10:50 | T0232-050927-08 | Actual | 11334 | cfu/g |
| 9978 | 30.039493 | -89.993056 | NAD83 | 17324 | 9/27/2005 10:10 | T0232-050927-06 | Actual | *Present >QL | |
| 9973 | 30.018605 | -90.02164 | NAD83 | 17319 | 9/27/2005 8:50 | T0232-050927-01 | Actual | *Non-detect | |
| 9976 | 30.033878 | -90.016466 | NAD83 | 17320 | 9/27/2005 9:00 | T0232-050927-02 | Actual | 4614 | cfu/g |
| 9977 | 30.037393 | -89.9993 | NAD83 | 17323 | 9/27/2005 10:00 | T0232-050927-05 | Actual | *Present >QL | |
| 9940 | 30.004006 | -90.119291 | WGS84 | 17300 | 9/26/2005 9:00 | RS909-db-G-N-09 | Actual | *Present >QL | |
| 9953 | 29.9928 | -90.112728 | WGS84 | 17314 | 9/26/2005 16:00 | RS921-db-G-D-09 | Estimated | *Non-detect | |
| 9953 | 29.9928 | -90.112728 | WGS84 | 17313 | 9/26/2005 16:00 | RS921-db-G-N-09 | Estimated | *Non-detect | |
| 9951 | 29.988785 | -90.110903 | WGS84 | 17311 | 9/26/2005 14:44 | RS920-db-G-N-09 | Actual | *Non-detect | |
| 9946 | 30.021178 | -90.07956 | WGS84 | 17306 | 9/26/2005 11:40 | RS915-db-G-N-09 | Actual | *Non-detect | |
| 9945 | 30.020003 | -90.088976 | WGS84 | 17305 | 9/26/2005 11:20 | RS914-db-G-N-09 | Actual | *Non-detect | |
| 9944 | 30.017243 | -90.103046 | WGS84 | 17304 | 9/26/2005 11:00 | RS913-DB-G-N-09 | Actual | *Non-detect | |
| 9943 | 30.014745 | -90.104035 | WGS84 | 17303 | 9/26/2005 10:40 | RS912-db-G-N-09 | Actual | *Present >QL | |

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| 9950 | 29.989026 | -90.08808 | WGS84 | 17310 | 9/26/2005 14:15 | RS919-db-G-N-09 | Actual | *Non-detect | |
| 9947 | 30.012885 | -90.081348 | WGS84 | 17307 | 9/26/2005 12:00 | RS916-db-G-N-09 | Actual | *Non-detect | |
| 9942 | 30.015066 | -90.11207 | WGS84 | 17302 | 9/26/2005 10:10 | RS911-db-G-N-09 | Actual | *Present >QL | |
| 9949 | 29.99889 | -90.103623 | WGS84 | 17309 | 9/26/2005 13:00 | RS918-DB-G-N-09 | Actual | *Non-detect | |
| 9948 | 29.99863 | -90.0822 | WGS84 | 17308 | 9/26/2005 12:30 | RS917-db-G-N-09 | Actual | *Present >QL | |
| 9892 | 30.016156 | -90.058148 | WGS84 | 17254 | 9/26/2005 12:09 | SS308-TS-G-N-09 | Actual | *Non-detect | |
| 9889 | 30.022033 | -90.079473 | WGS84 | 17249 | 9/26/2005 10:51 | SS305-TS-G-N-09 | Actual | 11316 | cfu/g |
| 9896 | 29.989076 | -90.054721 | WGS84 | 17258 | 9/26/2005 13:47 | SS312-TS-G-N-09 | Actual | *Present >QL | |
| 9894 | 30.000688 | -90.065353 | WGS84 | 17256 | 9/26/2005 13:10 | SS310-TS-G-N-09 | Actual | 7597 | cfu/g |
| 9890 | 30.01165 | -90.075816 | WGS84 | 17250 | 9/26/2005 11:10 | SS306-TS-G-N-09 | Estimated | *Non-detect | |
| 9887 | 30.022146 | -90.056236 | WGS84 | 17246 | 9/26/2005 0:00 | SS303-TS-G-N-09 | Actual | *Non-detect | |
| 9888 | 30.02517 | -90.063573 | WGS84 | 17247 | 9/26/2005 10:06 | SS304-TS-G-N-09 | Actual | *Present >QL | |
| 9886 | 30.021548 | -90.068465 | WGS84 | 17248 | 9/26/2005 10:32 | SS302-TS-G-N-09 | Actual | 15718 | cfu/g |
| 9897 | 29.994186 | -90.07147 | WGS84 | 17259 | 9/26/2005 14:07 | SS313-TS-G-N-09 | Actual | *Present >QL | |
| 9891 | 30.014003 | -90.068486 | WGS84 | 17253 | 9/26/2005 11:37 | SS307-TS-G-N-09 | Actual | *Present >QL | |
| 9895 | 29.992841 | -90.059301 | WGS84 | 17257 | 9/26/2005 13:25 | SS311-TS-G-N-09 | Actual | *Present >QL | |
| 9885 | 30.022908 | -90.05206 | WGS84 | 17245 | 9/26/2005 9:20 | SS301-TS-G-N-09 | Actual | *Present >QL | |
| 9884 | 30.011013 | -90.050745 | WGS84 | 17244 | 9/26/2005 8:52 | SS300-TS-G-N-09 | Actual | *Present >QL | |
| 9898 | 30.003788 | -90.077713 | WGS84 | 17260 | 9/26/2005 14:22 | SS314-TS-G-N-09 | Actual | 4577 | cfu/g |
| 9899 | 29.990523 | -90.080408 | WGS84 | 17261 | 9/26/2005 14:45 | SS315-TS-G-N-09 | Actual | 5722 | cfu/g |
| 10031 | 29.99148 | -90.040368 | NAD83 | 17532 | 9/25/2005 12:55 | RS907-DB-G-N-09 | Actual | *Non-detect | |
| 10032 | 29.992778 | -90.039353 | NAD83 | 17534 | 9/25/2005 13:20 | RS908-DB-G-D-09 | Estimated | 13070 | cfu/g |
| 10032 | 29.992778 | -90.039353 | NAD83 | 17533 | 9/25/2005 13:20 | RS908-DB-G-N-09 | Estimated | *Non-detect | |
| 10029 | 29.991598 | -90.041506 | NAD83 | 17530 | 9/25/2005 11:45 | RS905-DB-G-N-09 | Actual | *Non-detect | |
| 10030 | 29.991393 | -90.04323 | NAD83 | 17531 | 9/25/2005 12:20 | RS906-DB-G-N-09 | Actual | *Present >QL | |
| 10024 | 29.990375 | -90.04135 | NAD83 | 17529 | 9/25/2005 11:20 | RS904-DB-G-N-09 | Actual | *Non-detect | |
| 10020 | 29.987801 | -90.039436 | NAD83 | 17523 | 9/25/2005 9:10 | RS901-DB-G-N-09 | Actual | *Non-detect | |
| 10023 | 29.988521 | -90.040773 | NAD83 | 17526 | 9/25/2005 9:50 | RS902-DB-G-N-09 | Actual | *Non-detect | |
| 10022 | 29.987361 | -90.041236 | NAD83 | 17527 | 9/25/2005 10:50 | RS903-DB-G-N-09 | Actual | 5055 | cfu/g |
| 9821 | 30.043541 | -89.94467 | WGS84 | 17205 | 9/25/2005 15:00 | RS158-TD-G-N-09 | Actual | *Present >QL | |
| 9819 | 30.04451 | -89.89242 | WGS84 | 17203 | 9/25/2005 13:15 | RS156-TD-G-N-09 | Actual | 41487 | cfu/g |
| 9818 | 30.03347 | -89.921411 | WGS84 | 17202 | 9/25/2005 12:45 | RS155-TD-G-N-09 | Actual | *Present >QL | |
| 10019 | 29.98962 | -90.039125 | NAD83 | 17522 | 9/25/2005 8:30 | RS900-DB-G-N-09 | Actual | *Non-detect | |
| 9822 | 30.059955 | -89.947813 | WGS84 | 17206 | 9/25/2005 15:45 | RS159-TD-G-N-09 | Actual | 5253 | cfu/g |
| 9815 | 30.043321 | -89.923653 | WGS84 | 17199 | 9/25/2005 0:00 | RS152-TD-G-D-09 | Estimated | 7940 | cfu/g |
| 9816 | 30.040041 | -89.919353 | WGS84 | 17200 | 9/25/2005 11:45 | RS153-TD-G-N-09 | Actual | *Non-detect | |
| 9820 | 30.047955 | -89.88641 | WGS84 | 17204 | 9/25/2005 13:55 | RS157-TD-G-N-09 | Actual | 26383 | cfu/g |
| 9817 | 30.036723 | -89.925273 | WGS84 | 17201 | 9/25/2005 12:10 | RS154-TD-G-N-09 | Actual | *Present >QL | |
| 9815 | 30.043321 | -89.923653 | WGS84 | 17198 | 9/25/2005 11:15 | RS152-TD-G-N-09 | Estimated | *Present >QL | |

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| 9814 | 30.038391 | -89.933168 | WGS84 | 17197 | 9/25/2005 10:40 | RS151-TD-G-N-09 | Actual | *Non-detect | |
| 9812 | 30.02921 | -89.93238 | WGS84 | 17195 | 9/25/2005 8:30 | RS150-TD-G-N-09 | Actual | 2956 | cfu/g |
| 9687 | 29.948265 | -90.115746 | WGS84 | 17058 | 9/25/2005 12:15 | SS209-TS-G-N-09 | Actual | *Non-detect | |
| 9813 | 30.026998 | -89.926471 | WGS84 | 17196 | 9/25/2005 9:30 | RS149-TD-G-N-09 | Actual | 4516 | cfu/g |
| 9684 | 29.94705 | -90.096216 | WGS84 | 17230 | 9/25/2005 0:00 | SS206-TS-G-D-09 | Actual | 4373 | cfu/g |
| 9685 | 29.942281 | -90.089838 | WGS84 | 17056 | 9/25/2005 11:45 | SS207-TS-G-N-09 | Actual | *Present >QL | |
| 9686 | 29.939166 | -90.108141 | WGS84 | 17057 | 9/25/2005 12:00 | SS208-TS-G-N-09 | Actual | 170670 | cfu/g |
| 9680 | 29.947115 | -90.101786 | WGS84 | 17051 | 9/25/2005 0:00 | SS202-TS-G-N-09 | Actual | 1951 | cfu/g |
| 9679 | 29.9612 | -90.081733 | WGS84 | 17050 | 9/25/2005 8:45 | SS201-TS-G-N-09 | Actual | 13575 | cfu/g |
| 9681 | 29.960798 | -90.101738 | WGS84 | 17052 | 9/25/2005 9:55 | SS203-TS-G-N-09 | Actual | 13764 | cfu/g |
| 9595 | 30.006778 | -90.054158 | WGS84 | 16936 | 9/19/2005 14:40 | RS538-TD-G-N-09 | Actual | 37295 | cfu/g |
| 9593 | 30.016945 | -90.062215 | WGS84 | 16934 | 9/19/2005 0:00 | RS536-TD-G-N-09 | Actual | 2892 | cfu/g |
| 9590 | 30.007708 | -90.07029 | WGS84 | 16932 | 9/19/2005 11:35 | RS534-TD-G-N-09 | Actual | *Present >QL | |
| 9591 | 30.017491 | -90.075885 | WGS84 | 16933 | 9/19/2005 12:00 | RS535-TD-G-N-09 | Actual | 71904 | cfu/g |
| 9588 | 30.007925 | -90.084041 | WGS84 | 16931 | 9/19/2005 10:50 | RS533-TD-G-D-09 | Actual | 5855 | cfu/g |
| 9587 | 29.998008 | -90.076056 | WGS84 | 16929 | 9/19/2005 10:20 | RS532-TD-G-N-09 | Actual | 12322 | cfu/g |
| 9588 | 30.007925 | -90.084041 | WGS84 | 16930 | 9/19/2005 10:50 | RS533-TD-G-N-09 | Actual | 12977 | cfu/g |
| 9548 | 30.009961 | -90.101938 | WGS84 | 16867 | 9/18/2005 13:15 | RS432-kk-G-N-09 | Actual | 78864 | cfu/g |
| 9550 | 29.982995 | -90.085935 | WGS84 | 16869 | 9/18/2005 14:10 | RS434-kk-G-N-09 | Actual | 530740 | cfu/g |
| 9544 | 30.023386 | -90.11081 | WGS84 | 16863 | 9/18/2005 11:00 | RS428-kk-G-N-09 | Actual | *Non-detect | |
| 9547 | 29.999563 | -90.09475 | WGS84 | 16866 | 9/18/2005 12:40 | RS431-kk-G-N-09 | Actual | *Non-detect | |
| 9546 | 30.008643 | -90.08682 | WGS84 | 16865 | 9/18/2005 12:00 | RS430-kk-G-N-09 | Actual | *Non-detect | |
| 9545 | 30.020975 | -90.096111 | WGS84 | 16864 | 9/18/2005 11:40 | RS429-kk-G-N-09 | Actual | 76641 | cfu/g |
| 9551 | 29.988591 | -90.102281 | WGS84 | 16870 | 9/18/2005 14:30 | RS435-kk-G-N-09 | Actual | 10720 | cfu/g |
| 9552 | 29.983041 | -90.122386 | WGS84 | 16871 | 9/18/2005 14:55 | RS436-kk-G-N-09 | Actual | *Non-detect | |
| 9549 | 29.99739 | -90.111088 | WGS84 | 16868 | 9/18/2005 13:45 | RS433-kk-G-N-09 | Actual | *Non-detect | |
| 9543 | 30.009391 | -90.118341 | WGS84 | 16862 | 9/18/2005 10:05 | RS427-kk-G-D-09 | Actual | 11522 | cfu/g |
| 9529 | 30.017761 | -90.026148 | WGS84 | 16847 | 9/18/2005 14:20 | RS530-TD-G-N-09 | Actual | *Non-detect | |
| 9530 | 30.01318 | -90.016176 | WGS84 | 16848 | 9/18/2005 0:00 | RS531-TD-G-N-09 | Actual | 3393 | cfu/g |
| 9527 | 30.031351 | -90.026198 | WGS84 | 16845 | 9/18/2005 13:20 | RS528-TD-G-N-09 | Actual | *Non-detect | |
| 9528 | 30.022835 | -90.017963 | WGS84 | 16846 | 9/18/2005 0:00 | RS529-TD-G-N-09 | Actual | *Non-detect | |
| 9524 | 30.037786 | -90.010855 | WGS84 | 16843 | 9/18/2005 12:35 | RS526-TD-G-N-09 | Actual | *Non-detect | |
| 9526 | 30.02897 | -90.03214 | WGS84 | 16844 | 9/18/2005 0:00 | RS527-TD-G-N-09 | Actual | *Non-detect | |
| 9543 | 30.009391 | -90.118341 | WGS84 | 16861 | 9/18/2005 10:05 | RS427-kk-G-N-09 | Actual | 61730 | cfu/g |
| 9523 | 30.03037 | -90.00618 | WGS84 | 16842 | 9/18/2005 11:25 | RS525-TD-G-N-09 | Actual | *Non-detect | |
| 9521 | 30.02276 | -90.0105 | WGS84 | 16841 | 9/18/2005 0:00 | RS524-TD-G-D-09 | Actual | *Non-detect | |
| 9520 | 30.016725 | -90.001 | WGS84 | 16839 | 9/18/2005 9:45 | RS523-TD-G-N-09 | Actual | *Non-detect | |
| 9521 | 30.02276 | -90.0105 | WGS84 | 16840 | 9/18/2005 10:20 | RS524-TD-G-N-09 | Actual | *Non-detect | |
| 9451 | 30.00442 | -90.102665 | WGS84 | 16768 | 9/17/2005 14:00 | RS425-DB-G-N-09 | Actual | 19698 | cfu/g |

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| 9448 | 29.967745 | -90.007731 | WGS84 | 16764 | 9/17/2005 11:26 | RS422-DB-G-N-09 | Actual | 23788 | cfu/g |
| 9449 | 29.973036 | -90.011968 | WGS84 | 16766 | 9/17/2005 12:30 | RS423-DB-G-N-09 | Actual | *Non-detect | |
| 9450 | 29.99725 | -90.107701 | WGS84 | 16767 | 9/17/2005 13:41 | RS424-DB-G-N-09 | Actual | 593640 | cfu/g |
| 9446 | 29.969465 | -90.01423 | WGS84 | 16789 | 9/17/2005 10:55 | RS421-DB-G-N-09 | Actual | *Non-detect | |
| 9445 | 29.970686 | -90.018655 | WGS84 | 16762 | 9/17/2005 10:10 | RS420-db-G-N-09 | Estimated | 202960 | cfu/g |
| 9418 | 30.005995 | -90.004415 | WGS84 | 16666 | 9/16/2005 12:30 | RS514-TD-G-N-09 | Actual | *Non-detect | |
| 9417 | 30.02291 | -89.926845 | WGS84 | 16665 | 9/16/2005 11:45 | RS513-TD-G-N-09 | Actual | *Non-detect | |
| 9416 | 30.038611 | -89.913246 | WGS84 | 16664 | 9/16/2005 11:00 | RS512-TD-G-N-09 | Actual | 16864 | cfu/g |
| 9420 | 30.005205 | -90.024338 | WGS84 | 16667 | 9/16/2005 13:25 | RS515-TD-G-N-09 | Actual | *Non-detect | |
| 9413 | 30.03261 | -89.894905 | WGS84 | 16662 | 9/16/2005 9:20 | RS510-TD-G-D-09 | Actual | *Non-detect | |
| 9415 | 30.021705 | -89.900965 | WGS84 | 16663 | 9/16/2005 0:00 | RS511-TD-G-N-09 | Actual | *Non-detect | |
| 9413 | 30.03261 | -89.894905 | WGS84 | 16661 | 9/16/2005 9:20 | RS510-TD-G-N-09 | Actual | *Non-detect | |
| 9408 | 30.037795 | -90.006358 | WGS84 | 16658 | 9/16/2005 12:10 | RS418-RK-G-N-09 | Actual | *Non-detect | |
| 9409 | 30.020645 | -90.013646 | WGS84 | 16659 | 9/16/2005 12:35 | RS419-RK-G-N-09 | Actual | *Non-detect | |
| 9407 | 30.031903 | -89.996248 | WGS84 | 16657 | 9/16/2005 0:00 | RS417-RK-G-N-09 | Actual | 33576 | cfu/g |
| 9404 | 30.04226 | -89.940375 | WGS84 | 16654 | 9/16/2005 10:30 | RS414-RK-G-N-09 | Actual | *Non-detect | |
| 9406 | 30.047113 | -89.9838 | WGS84 | 16656 | 9/16/2005 11:15 | RS416-RK-G-N-09 | Actual | 20434 | cfu/g |
| 9405 | 30.029928 | -89.97074 | WGS84 | 16655 | 9/16/2005 11:00 | RS415-RK-G-N-09 | Actual | 416250 | cfu/g |
| 9403 | 30.044481 | -89.96238 | WGS84 | 16651 | 9/16/2005 9:50 | RS413-RK-G-N-09 | Actual | *Non-detect | |
| 9403 | 30.044481 | -89.96238 | WGS84 | 16652 | 9/16/2005 9:50 | RS413-RK-G-D-09 | Actual | *Non-detect | |
| 9349 | 29.975776 | -90.054536 | WGS84 | 16553 | 9/15/2005 11:45 | RS604-SO-G-D-09 | Actual | *Present >QL | |
| 9335 | 30.019278 | -89.994501 | WGS84 | 16537 | 9/15/2005 10:15 | RS405-AD-G-D-09 | Actual | *Non-detect | |
| 9340 | 30.024816 | -89.955936 | WGS84 | 16540 | 9/15/2005 11:35 | RS409-AD-G-N-09 | Actual | *Present >QL | |
| 9361 | 30.00514 | -90.05052 | WGS84 | 16567 | 9/15/2005 12:40 | RS505-TD-G-N-09 | Actual | *Non-detect | |
| 9359 | 30.00615 | -90.041335 | WGS84 | 16565 | 9/15/2005 11:35 | RS503-TD-G-N-09 | Actual | *Non-detect | |
| 9365 | 29.99012 | -90.06854 | WGS84 | 16571 | 9/15/2005 15:00 | RS509-TD-G-N-09 | Actual | *Non-detect | |
| 9364 | 29.997465 | -90.06351 | WGS84 | 16570 | 9/15/2005 14:30 | RS508-TD-G-N-09 | Actual | *Non-detect | |
| 9363 | 30.00492 | -90.05708 | WGS84 | 16569 | 9/15/2005 14:05 | RS507-TD-G-N-09 | Actual | *Present >QL | |
| 9384 | 30.004695 | -90.034195 | NAD83 | 16564 | 9/15/2005 11:00 | RS502-TD-G-N-09 | Actual | *Non-detect | |
| 9362 | 29.998298 | -90.053961 | WGS84 | 16568 | 9/15/2005 13:30 | RS506-TD-G-N-09 | Actual | *Present >QL | |
| 9360 | 29.99705 | -90.045345 | WGS84 | 16566 | 9/15/2005 12:10 | RS504-TD-G-N-09 | Actual | *Non-detect | |
| 9356 | 30.01122 | -90.01769 | WGS84 | 16561 | 9/15/2005 10:10 | RS501-TD-G-D-09 | Actual | 6006 | cfu/g |
| 9348 | 29.976996 | -90.066343 | WGS84 | 16550 | 9/15/2005 11:15 | RS603-SO-G-N-09 | Actual | 11341 | cfu/g |
| 9355 | 29.975903 | -90.076103 | WGS84 | 16558 | 9/15/2005 15:00 | RS609-SO-G-N-09 | Actual | 396320 | cfu/g |
| 9351 | 29.966255 | -90.034113 | WGS84 | 16555 | 9/15/2005 13:15 | RS606-SO-G-N-09 | Actual | 1703 | cfu/g |
| 9349 | 29.975776 | -90.054536 | WGS84 | 16552 | 9/15/2005 11:40 | RS604-SO-G-N-09 | Actual | *Present >QL | |
| 9356 | 30.01122 | -90.01769 | WGS84 | 16560 | 9/15/2005 10:10 | RS501-TD-G-N-09 | Actual | *Non-detect | |
| 9352 | 29.968088 | -90.071328 | WGS84 | 16556 | 9/15/2005 13:35 | RS607-SO-G-N-09 | Actual | *Non-detect | |
| 9350 | 29.976151 | -90.043471 | WGS84 | 16554 | 9/15/2005 12:30 | RS605-SO-G-N-09 | Actual | *Non-detect | |

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| 9354 | 29.968931 | -90.080403 | WGS84 | 16557 | 9/15/2005 14:15 | RS608-SO-G-N-09 | Actual | *Non-detect | |
| 9336 | 30.019208 | -89.985073 | WGS84 | 16538 | 9/15/2005 10:45 | RS406-AD-G-N-09 | Actual | *Non-detect | |
| 9343 | 30.024801 | -89.981856 | WGS84 | 16544 | 9/15/2005 12:30 | RS412-AD-G-N-09 | Actual | *Non-detect | |
| 9342 | 30.023888 | -89.973678 | WGS84 | 16543 | 9/15/2005 12:10 | RS411-AD-G-N-09 | Actual | *Non-detect | |
| 9347 | 29.98477 | -90.07031 | WGS84 | 16551 | 9/15/2005 10:30 | RS602-SO-G-N-09 | Actual | *Present >QL | |
| 9341 | 30.025238 | -89.964191 | WGS84 | 16542 | 9/15/2005 11:55 | RS410-AD-G-N-09 | Actual | 40515 | cfu/g |
| 9346 | 29.983791 | -90.076665 | WGS84 | 16549 | 9/15/2005 9:50 | RS601-SO-G-N-09 | Actual | *Non-detect | |
| 9338 | 30.019681 | -89.968393 | WGS84 | 16541 | 9/15/2005 11:25 | RS408-AD-G-N-09 | Actual | 66756 | cfu/g |
| 9335 | 30.019278 | -89.994501 | WGS84 | 16536 | 9/15/2005 10:15 | RS405-AD-G-N-09 | Actual | *Non-detect | |
| 9337 | 30.018778 | -89.976526 | WGS84 | 16539 | 9/15/2005 11:05 | RS407-AD-G-N-09 | Actual | *Non-detect | |
| 9260 | 29.989143 | -90.049165 | WGS84 | 16459 | 9/14/2005 10:45 | RS153-SO-G-N-09 | Actual | *Non-detect | |
| 9265 | 29.981555 | -90.034271 | WGS84 | 16446 | 9/14/2005 13:15 | RS157-SO-G-N-09 | Actual | *Non-detect | |
| 9269 | 29.967965 | -90.030685 | WGS84 | 16451 | 9/14/2005 15:15 | RS453-SO-G-D-09 | Actual | *Non-detect | |
| 9288 | 29.965966 | -90.023061 | WGS84 | 16458 | 9/14/2005 10:40 | RS404-AD-G-N-09 | Actual | *Non-detect | |
| 9285 | 29.973176 | -90.122108 | WGS84 | 16454 | 9/14/2005 8:45 | RS401-AD-G-N-09 | Actual | *Non-detect | |
| 9287 | 29.958536 | -90.100511 | WGS84 | 16457 | 9/14/2005 9:50 | RS403-AD-G-N-09 | Actual | *Non-detect | |
| 9283 | 29.985708 | -90.026873 | WGS84 | 16439 | 9/14/2005 9:15 | RS151-SO-G-N-09 | Actual | *Non-detect | |
| 9286 | 29.972831 | -90.111871 | WGS84 | 16456 | 9/14/2005 9:15 | RS402-AD-G-D-09 | Actual | *Non-detect | |
| 9286 | 29.972831 | -90.111871 | WGS84 | 16455 | 9/14/2005 9:15 | RS402-AD-G-N-09 | Actual | *Non-detect | |
| 9269 | 29.967965 | -90.030685 | WGS84 | 16450 | 9/14/2005 15:15 | RS453-SO-G-N-09 | Actual | *Non-detect | |
| 9267 | 29.973778 | -90.053851 | WGS84 | 16461 | 9/14/2005 14:30 | RS451-SO-G-N-09 | Actual | *Non-detect | |
| 9268 | 29.97265 | -90.04378 | WGS84 | 16449 | 9/14/2005 15:00 | RS452-SO-G-N-09 | Actual | *Non-detect | |
| 9263 | 29.97417 | -90.039371 | WGS84 | 16445 | 9/14/2005 12:45 | RS156-SO-G-N-09 | Actual | *Non-detect | |
| 9266 | 29.973988 | -90.029406 | WGS84 | 16447 | 9/14/2005 13:45 | RS158-SO-G-N-09 | Actual | *Non-detect | |
| 9262 | 29.981825 | -90.044206 | WGS84 | 16438 | 9/14/2005 12:00 | RS155-SO-G-N-09 | Actual | *Non-detect | |
| 9261 | 29.982056 | -90.05336 | WGS84 | 16444 | 9/14/2005 11:30 | RS154-SO-G-N-09 | Actual | *Non-detect | |
| 9238 | 29.96552 | -90.12731 | WGS84 | 16402 | 9/14/2005 13:05 | RS148-TD-G-N-09 | Actual | *Non-detect | |
| 9259 | 29.992156 | -90.037753 | WGS84 | 16460 | 9/14/2005 9:45 | RS152-SO-G-N-09 | Actual | *Non-detect | |
| 9259 | 29.992156 | -90.037753 | WGS84 | 16453 | 9/14/2005 9:45 | RS152-SO-G-D-09 | Actual | *Non-detect | |
| 9236 | 29.951925 | -90.1056 | WGS84 | 16400 | 9/14/2005 11:55 | RS146-TD-G-N-09 | Actual | *Non-detect | |
| 9237 | 29.96523 | -90.117095 | WGS84 | 16401 | 9/14/2005 12:25 | RS147-TD-G-N-09 | Actual | *Non-detect | |
| 9235 | 29.95187 | -90.096155 | WGS84 | 16399 | 9/14/2005 0:00 | RS145-TD-G-N-09 | Actual | *Non-detect | |
| 9233 | 29.94409 | -90.100931 | WGS84 | 16397 | 9/14/2005 10:05 | RS143-TD-G-N-09 | Actual | *Non-detect | |
| 9234 | 29.943845 | -90.091 | WGS84 | 16398 | 9/14/2005 10:30 | RS144-TD-G-N-09 | Actual | *Non-detect | |
| 9231 | 29.944085 | -90.110905 | WGS84 | 16395 | 9/14/2005 9:20 | RS142-TD-G-N-09 | Actual | *Non-detect | |
| 9231 | 29.944085 | -90.110905 | WGS84 | 16396 | 9/14/2005 9:20 | RS142-TD-G-D-09 | Actual | *Non-detect | |
| 9190 | 29.934516 | -90.113513 | WGS84 | 16355 | 9/13/2005 12:15 | RS117-AD-G-D-09 | Actual | 996260 | cfu/g |
| 9212 | 30.00229 | -89.97537 | WGS84 | 16377 | 9/13/2005 14:50 | RS127-TD-G-N-09 | Actual | *Non-detect | |
| 9208 | 30.012865 | -89.97523 | WGS84 | 16375 | 9/13/2005 12:15 | RS124-TD-G-N-09 | Actual | *Non-detect | |

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| 9210 | 30.010795 | -89.958535 | WGS84 | 16376 | 9/13/2005 13:00 | RS125-TD-G-N-09 | Actual | *Non-detect | |
| 9211 | 30.002875 | -89.969805 | WGS84 | 16370 | 9/13/2005 0:00 | RS126-TD-G-N-09 | Actual | *Non-detect | |
| 9214 | 30.00478 | -90.019815 | WGS84 | 16379 | 9/13/2005 16:50 | RS129-TD-G-N-09 | Actual | *Non-detect | |
| 9213 | 30.00069 | -89.990325 | WGS84 | 16378 | 9/13/2005 15:35 | RS128-TD-G-N-09 | Actual | *Non-detect | |
| 9208 | 30.012865 | -89.97523 | WGS84 | 16374 | 9/13/2005 12:15 | RS124-TD-G-D-09 | Actual | *Non-detect | |
| 9191 | 29.940043 | -90.116948 | WGS84 | 16356 | 9/13/2005 12:40 | RS118-AD-G-N-09 | Actual | 17142 | cfu/g |
| 9207 | 30.023095 | -89.94945 | WGS84 | 16373 | 9/13/2005 11:50 | RS123-TD-G-N-09 | Actual | *Non-detect | |
| 9205 | 30.012185 | -89.989855 | WGS84 | 16371 | 9/13/2005 10:50 | RS121-TD-G-N-09 | Actual | *Non-detect | |
| 9206 | 30.012815 | -89.98159 | WGS84 | 16372 | 9/13/2005 11:20 | RS122-TD-G-N-09 | Actual | *Non-detect | |
| 9187 | 29.932511 | -90.089318 | WGS84 | 16351 | 9/13/2005 11:15 | RS114-AD-G-N-09 | Actual | 1294 | cfu/g |
| 9190 | 29.934516 | -90.113513 | WGS84 | 16354 | 9/13/2005 12:15 | RS117-AD-G-N-09 | Actual | 19876 | cfu/g |
| 9186 | 29.939006 | -90.084653 | WGS84 | 16350 | 9/13/2005 10:55 | RS113-AD-G-N-09 | Actual | *Non-detect | |
| 9189 | 29.933893 | -90.106513 | WGS84 | 16353 | 9/13/2005 12:00 | RS116-AD-G-N-09 | Actual | 12060 | cfu/g |
| 9188 | 29.933591 | -90.098438 | WGS84 | 16352 | 9/13/2005 11:40 | RS115-AD-G-N-09 | Actual | *Present >QL | |
| 9162 | 29.955093 | -90.132848 | WGS84 | 16339 | 9/13/2005 11:44 | RS109-JC-G-N-09 | Actual | *Non-detect | |
| 9184 | 29.927233 | -90.093601 | WGS84 | 16348 | 9/13/2005 10:10 | RS111-AD-G-N-09 | Actual | 6517 | cfu/g |
| 9185 | 29.927553 | -90.101915 | WGS84 | 16349 | 9/13/2005 10:40 | RS112-AD-G-N-09 | Actual | 260160 | cfu/g |
| 9159 | 29.949173 | -90.121583 | WGS84 | 16337 | 9/13/2005 11:11 | RS106-JC-G-N-09 | Actual | *Non-detect | |
| 9160 | 29.943496 | -90.125071 | WGS84 | 16338 | 9/13/2005 11:27 | RS107-JC-G-N-09 | Actual | *Non-detect | |
| 9161 | 29.955425 | -90.125071 | WGS84 | 16340 | 9/13/2005 11:44 | RS108-JC-G-N-09 | Actual | 223970 | cfu/g |
| 9158 | 29.95478 | -90.116945 | WGS84 | 16336 | 9/13/2005 10:56 | RS105-JC-G-N-09 | Actual | *Non-detect | |
| 9157 | 29.961093 | -90.114311 | WGS84 | 16335 | 9/13/2005 10:35 | RS104-JC-G-D-09 | Actual | *Non-detect | |
| 9157 | 29.961093 | -90.114311 | WGS84 | 16334 | 9/13/2005 10:35 | RS104-JC-G-N-09 | Actual | *Non-detect | |
| 9156 | 29.960915 | -90.121605 | WGS84 | 16333 | 9/13/2005 10:16 | RS103-JC-G-N-09 | Actual | *Non-detect | |
| 9155 | 29.961708 | -90.127961 | WGS84 | 16332 | 9/13/2005 10:04 | RS102-JC-G-N-09 | Actual | 8916 | cfu/g |
| 8964 | 29.964105 | -90.0149 | WGS84 | 16320 | 9/12/2005 13:35 | RS068-TD-G-N-09 | Actual | 95577 | cfu/g |
| 8960 | 29.96977 | -90.0312 | WGS84 | 16312 | 9/12/2005 14:45 | RS069-TD-G-N-09 | Actual | 4972 | cfu/g |
| 8962 | 29.962805 | -90.009 | WGS84 | 16319 | 9/12/2005 13:20 | RS067-TD-G-N-09 | Actual | 42886 | cfu/g |
| 8914 | 29.97323 | -90.04782 | WGS84 | 16277 | 9/12/2005 11:10 | RS052-AD-G-N-09 | Actual | *Present >QL | |
| 8913 | 29.97318 | -90.05359 | WGS84 | 16275 | 9/12/2005 10:40 | RS051-AD-G-N-09 | Actual | 14192 | cfu/g |
| 8912 | 29.97321 | -90.05968 | WGS84 | 16274 | 9/12/2005 10:25 | RS040-AD-G-N-09 | Actual | *Non-detect | |
| 8911 | 29.96824 | -90.06176 | WGS84 | 16272 | 9/12/2005 10:05 | RS039-AD-G-N-09 | Actual | 3589 | cfu/g |
| 8910 | 29.96838 | -90.06916 | WGS84 | 16271 | 9/12/2005 9:35 | RS038-AD-G-D-09 | Actual | *Non-detect | |
| 8910 | 29.96838 | -90.06916 | WGS84 | 16270 | 9/12/2005 9:35 | RS038-AD-G-N-09 | Actual | *Non-detect | |
| 8497 | 29.97281 | -90.11645 | WGS84 | 15973 | 9/11/2005 15:30 | RS037-AD-G-N-09 | Actual | 68900 | cfu/g |
| 8902 | 29.94316 | -90.08256 | WGS84 | 15964 | 9/11/2005 0:00 | RS030-AD-G-N-09 | Actual | 289690 | cfu/g |
| 8495 | 29.98376 | -90.09815 | WGS84 | 15971 | 9/11/2005 13:30 | RS035-AD-G-N-09 | Actual | 67974 | cfu/g |
| 8494 | 29.97697 | -90.08321 | WGS84 | 15970 | 9/11/2005 13:10 | RS034-AD-G-N-09 | Actual | 96895 | cfu/g |
| 8493 | 29.9644 | -90.06847 | WGS84 | 15969 | 9/11/2005 12:40 | RS033-AD-G-N-09 | Actual | 61659 | cfu/g |

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| 8490 | 29.95273 | -90.079772 | WGS84 | 15966 | 9/11/2005 10:55 | RS031-AD-G-N-09 | Actual | 14818 | cfu/g |
| 8491 | 29.95994 | -90.07092 | WGS84 | 15967 | 9/11/2005 11:50 | RS032-AD-G-N-09 | Actual | 11735 | cfu/g |
| 8491 | 29.95994 | -90.07092 | WGS84 | 15968 | 9/11/2005 11:50 | RS032-AD-G-D-09 | Actual | 33200 | cfu/g |
| 11441 | 29.97472 | -90.017433 | NAD83 | 22297 | 11/6/2005 14:45 | T0630-051106-05 | Actual | *Non-detect | |
| 11441 | 29.97472 | -90.017433 | NAD83 | 22295 | 11/6/2005 14:45 | T0630-051106-05 | Actual | *Non-detect | |
| 11442 | 29.967591 | -90.02251 | NAD83 | 22296 | 11/6/2005 14:57 | T0630-051106-06 | Actual | *Non-detect | |
| 14031 | 29.97403 | -90.008193 | NAD83 | 31221 | 11/5/2005 13:00 | T0630-051105-01 | Actual | 155340 | cfu/g |
| 11322 | 29.957013 | -90.012555 | NAD83 | 22127 | 11/4/2005 14:10 | T0924-051104-06 | Actual | 41512 | cfu/g |
| 11321 | 29.959285 | -90.021505 | NAD83 | 22126 | 11/4/2005 13:25 | T0924-051104-05 | Actual | *Non-detect | |
| 11320 | 29.958936 | -90.025896 | NAD83 | 22125 | 11/4/2005 12:50 | T0924-051104-04 | Actual | 529140 | cfu/g |
| 11304 | 29.964678 | -90.005523 | NAD83 | 22068 | 11/3/2005 14:25 | T0924-051103-06 | Actual | *Non-detect | |
| 11302 | 29.97383 | -90.001036 | NAD83 | 22066 | 11/3/2005 13:40 | T0924-051103-04 | Actual | *Non-detect | |
| 11303 | 29.968581 | -90.003678 | NAD83 | 22067 | 11/3/2005 14:05 | T0924-051103-05 | Actual | *Non-detect | |
| 12439 | 29.967445 | -90.014451 | NAD83 | 31080 | 11/2/2005 15:30 | T0924-051102-05 | Actual | *Non-detect | |
| 12438 | 29.968993 | -90.021401 | NAD83 | 31147 | 11/2/2005 14:55 | T0924-051102-04 | Actual | *Non-detect | |
| 12440 | 29.965786 | -90.008908 | NAD83 | 31267 | 11/2/2005 15:58 | T0924-051102-06 | Actual | *Non-detect | |
| 12438 | 29.968993 | -90.021401 | NAD83 | 31281 | 11/2/2005 14:55 | T0924-051102-04 | Actual | *Non-detect | |
| 12476 | 29.973748 | -90.015376 | NAD83 | 31174 | 10/30/2005 9:57 | T0335-051030-01 | Actual | *Non-detect | |
| 12477 | 29.96973 | -90.009515 | NAD83 | 31121 | 10/30/2005 10:45 | T0335-051030-02 | Actual | *Non-detect | |
| 12478 | 29.971111 | -90.007386 | NAD83 | 31105 | 10/30/2005 11:36 | T0335-051030-03 | Actual | *Non-detect | |
| 12478 | 29.971111 | -90.007386 | NAD83 | 31110 | 10/30/2005 11:30 | T0335-051030-03 | Actual | *Non-detect | |
| 12243 | 29.977678 | -90.010815 | NAD83 | 31063 | 10/29/2005 11:25 | T0335-051029-02 | Actual | *Non-detect | |
| 12473 | 29.978931 | -90.016365 | NAD83 | 31126 | 10/29/2005 11:55 | T0335-051029-03 | Actual | *Non-detect | |
| 12242 | 29.975648 | -90.004063 | NAD83 | 31206 | 10/29/2005 10:40 | T0335-051029-01 | Actual | *Non-detect | |
| 12475 | 29.978153 | -90.02005 | NAD83 | 31046 | 10/29/2005 12:50 | T0335-051029-05 | Actual | *Non-detect | |
| 12474 | 29.979498 | -90.019781 | NAD83 | 31268 | 10/29/2005 12:15 | T0335-051029-04 | Actual | *Non-detect | |
| 12475 | 29.978153 | -90.02005 | NAD83 | 31256 | 10/29/2005 12:50 | T0335-051029-05 | Actual | *Non-detect | |
| 10631 | 29.975536 | -90.003793 | NAD83 | 19250 | 10/10/2005 14:38 | T0442-051010-04 | Actual | *Non-detect | |
| 10170 | 29.964071 | -90.0147 | NAD83 | 17890 | 9/30/2005 12:35 | T0232-050930-07 | Actual | *Non-detect | |
| 10169 | 29.962608 | -90.009371 | NAD83 | 17889 | 9/30/2005 12:25 | T0232-050930-06 | Actual | *Non-detect | |
| 10168 | 29.966876 | -90.008075 | NAD83 | 17887 | 9/30/2005 12:05 | T0232-050930-05 | Actual | *Non-detect | |
| 10171 | 29.961723 | -90.021546 | NAD83 | 17891 | 9/30/2005 13:00 | T0232-050930-08 | Actual | *Non-detect | |
| 10166 | 29.969525 | -90.014155 | NAD83 | 17886 | 9/30/2005 10:46 | T0232-050930-03 | Actual | 52367 | cfu/g |
| 10167 | 29.973001 | -90.011981 | NAD83 | 17888 | 9/30/2005 10:46 | T0232-050930-04 | Actual | *Non-detect | |
| 10165 | 29.970555 | -90.018676 | NAD83 | 17885 | 9/30/2005 10:05 | T0232-050930-02 | Actual | *Non-detect | |
| 10164 | 29.965965 | -90.023136 | NAD83 | 17884 | 9/30/2005 9:16 | T0232-050930-01 | Actual | *Non-detect | |

## St. Bernard Parish sediment fecal coliforms

The units as downloaded were cfu/100 mL. These were changed to cfu/g for this report.

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| 11121 | 29.949615 | -89.93824 | NAD83 | 21320 | 10/27/2005 13:53 | T0918-051027-01 | Actual | *Non-detect | |
| 12431 | 29.873025 | -89.863261 | NAD83 | 31202 | 11/27/2005 14:10 | T0703-051127-10 | Actual | *Non-detect | |
| 12429 | 29.86734 | -89.82044 | NAD83 | 31153 | 11/27/2005 13:35 | T0703-051127-08 | Actual | 4261 | cfu/g |
| 12428 | 29.892415 | -89.898335 | NAD83 | 31086 | 11/27/2005 13:10 | T0703-051127-07 | Actual | *Non-detect | |
| 12426 | 29.864708 | -89.817681 | NAD83 | 31146 | 11/27/2005 11:40 | T0703-051127-05 | Actual | *Non-detect | |
| 12430 | 29.87303 | -89.847926 | NAD83 | 31197 | 11/27/2005 13:55 | T0703-051127-09 | Actual | *Non-detect | |
| 12425 | 29.863238 | -89.817976 | NAD83 | 31013 | 11/27/2005 11:20 | T0703-051127-04 | Actual | 1110700 | cfu/g |
| 12423 | 29.865776 | -89.839501 | NAD83 | 31186 | 11/27/2005 10:30 | T0703-051127-02 | Actual | *Non-detect | |
| 12427 | 29.866166 | -89.817896 | NAD83 | 31278 | 11/27/2005 11:55 | T0703-051127-06 | Actual | 426230 | cfu/g |
| 12422 | 29.865758 | -89.84175 | NAD83 | 31260 | 11/27/2005 10:00 | T0703-051127-01 | Estimated | 402240 | cfu/g |
| 12424 | 29.864768 | -89.837635 | NAD83 | 31251 | 11/27/2005 10:50 | T0703-051127-03 | Actual | *Non-detect | |
| 12422 | 29.865758 | -89.84175 | NAD83 | 31088 | 11/27/2005 10:00 | T0703-051127-01 | Estimated | 5268 | cfu/g |
| 12413 | 29.872581 | -89.865655 | NAD83 | 31201 | 11/26/2005 10:45 | T0703-051126-02 | Actual | *Non-detect | |
| 12412 | 29.873165 | -89.853805 | NAD83 | 31249 | 11/26/2005 10:15 | T0703-051126-01 | Estimated | 1121 | cfu/g |
| 12421 | 29.876083 | -89.817458 | NAD83 | 31135 | 11/26/2005 14:45 | T0703-051126-10 | Actual | *Non-detect | |
| 12420 | 29.877218 | -89.806811 | NAD83 | 31099 | 11/26/2005 14:25 | T0703-051126-09 | Actual | *Non-detect | |
| 12419 | 29.876088 | -89.832251 | NAD83 | 31026 | 11/26/2005 14:05 | T0703-051126-08 | Actual | *Non-detect | |
| 12418 | 29.87704 | -89.828796 | NAD83 | 31094 | 11/26/2005 13:50 | T0703-051126-07 | Actual | 3300 | cfu/g |
| 12415 | 29.869451 | -89.854835 | NAD83 | 31122 | 11/26/2005 11:45 | T0703-051126-04 | Actual | 3785 | cfu/g |
| 12412 | 29.873165 | -89.853805 | NAD83 | 31280 | 11/26/2005 10:15 | T0703-051126-01 | Estimated | *Non-detect | |
| 12417 | 29.868023 | -89.83229 | NAD83 | 31154 | 11/26/2005 13:35 | T0703-051126-06 | Actual | *Non-detect | |
| 12416 | 29.872211 | -89.85483 | NAD83 | 31133 | 11/26/2005 12:05 | T0703-051126-05 | Actual | *Non-detect | |
| 12414 | 29.868271 | -89.854605 | NAD83 | 31005 | 11/26/2005 11:35 | T0703-051126-03 | Actual | *Non-detect | |
| 12336 | 29.860723 | -89.780796 | NAD83 | 31225 | 11/25/2005 11:50 | T0456-051125-02 | Actual | *Non-detect | |
| 12337 | 29.861425 | -89.78055 | NAD83 | 31288 | 11/25/2005 12:05 | T0456-051125-03 | Actual | *Non-detect | |
| 12343 | 29.87197 | -89.80949 | NAD83 | 31014 | 11/25/2005 15:25 | T0456-051125-09 | Actual | *Non-detect | |
| 12339 | 29.861966 | -89.779606 | NAD83 | 31144 | 11/25/2005 12:25 | T0456-051125-05 | Actual | *Non-detect | |
| 12344 | 29.867838 | -89.800561 | NAD83 | 31004 | 11/25/2005 15:55 | T0456-051125-10 | Actual | *Non-detect | |
| 12340 | 29.86036 | -89.777253 | NAD83 | 31019 | 11/25/2005 14:05 | T0456-051125-06 | Actual | 1798 | cfu/g |
| 12338 | 29.862765 | -89.78095 | NAD83 | 31214 | 11/25/2005 12:15 | T0456-051125-04 | Actual | *Non-detect | |
| 12335 | 29.861766 | -89.783311 | NAD83 | 31265 | 11/25/2005 11:05 | T0456-051125-01 | Actual | 48173 | cfu/g |
| 12342 | 29.862478 | -89.779916 | NAD83 | 31123 | 11/25/2005 14:40 | T0456-051125-08 | Actual | *Non-detect | |
| 12341 | 29.859836 | -89.776553 | NAD83 | 31183 | 11/25/2005 14:30 | T0456-051125-07 | Actual | *Non-detect | |
| 12336 | 29.860723 | -89.780796 | NAD83 | 31156 | 11/25/2005 11:50 | T0456-051125-02 | Actual | *Non-detect | |

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| 12402 | 29.866918 | -89.802075 | NAD83 | 31143 | 11/24/2005 9:40 | T0703-051124-01 | Actual | *Non-detect | |
| 12402 | 29.866918 | -89.802075 | NAD83 | 31016 | 11/24/2005 9:40 | T0703-051124-01 | Actual | *Non-detect | |
| 12406 | 29.863363 | -89.797396 | NAD83 | 31200 | 11/24/2005 11:00 | T0703-051124-05 | Actual | *Non-detect | |
| 12405 | 29.861415 | -89.797731 | NAD83 | 31136 | 11/24/2005 10:45 | T0703-051124-04 | Actual | 335700 | cfu/g |
| 12404 | 29.865601 | -89.798221 | NAD83 | 31089 | 11/24/2005 10:30 | T0703-051124-03 | Actual | *Non-detect | |
| 12409 | 29.862018 | -89.796925 | NAD83 | 31207 | 11/24/2005 13:40 | T0703-051124-08 | Actual | 29757 | cfu/g |
| 12411 | 29.876321 | -89.82893 | NAD83 | 31137 | 11/24/2005 14:25 | T0703-051124-10 | Actual | *Non-detect | |
| 12408 | 29.86491 | -89.796798 | NAD83 | 31151 | 11/24/2005 13:25 | T0703-051124-07 | Actual | *Non-detect | |
| 12410 | 29.876051 | -89.808053 | NAD83 | 31285 | 11/24/2005 14:15 | T0703-051124-09 | Actual | *Non-detect | |
| 12407 | 29.865985 | -89.797526 | NAD83 | 31263 | 11/24/2005 11:15 | T0703-051124-06 | Actual | *Non-detect | |
| 12403 | 29.868831 | -89.802198 | NAD83 | 31258 | 11/24/2005 10:05 | T0703-051124-02 | Actual | *Non-detect | |
| 12327 | 29.866363 | -89.811728 | NAD83 | 31176 | 11/23/2005 13:00 | T0456-051123-03 | Actual | *Non-detect | |
| 12327 | 29.866363 | -89.811728 | NAD83 | 31296 | 11/23/2005 13:00 | T0456-051123-03 | Actual | *Non-detect | |
| 12332 | 29.867448 | -89.808723 | NAD83 | 31289 | 11/23/2005 15:45 | T0456-051123-08 | Actual | *Non-detect | |
| 12333 | 29.869303 | -89.808808 | NAD83 | 31222 | 11/23/2005 16:00 | T0456-051123-09 | Actual | 5320 | cfu/g |
| 12330 | 29.862846 | -89.804786 | NAD83 | 31205 | 11/23/2005 15:05 | T0456-051123-06 | Actual | *Non-detect | |
| 12331 | 29.869478 | -89.807868 | NAD83 | 31209 | 11/23/2005 15:20 | T0456-051123-07 | Actual | 17798 | cfu/g |
| 12329 | 29.864705 | -89.805188 | NAD83 | 31182 | 11/23/2005 14:55 | T0456-051123-05 | Actual | *Non-detect | |
| 12328 | 29.866373 | -89.805126 | NAD83 | 31120 | 11/23/2005 14:45 | T0456-051123-04 | Actual | *Non-detect | |
| 12326 | 29.868115 | -89.812765 | NAD83 | 31068 | 11/23/2005 12:50 | T0456-051123-02 | Actual | *Non-detect | |
| 12334 | 29.873601 | -89.80825 | NAD83 | 31148 | 11/23/2005 16:20 | T0456-051123-10 | Actual | *Non-detect | |
| 12325 | 29.871796 | -89.81353 | NAD83 | 31027 | 11/23/2005 12:35 | T0456-051123-01 | Actual | *Non-detect | |
| 12401 | 29.875075 | -89.813698 | NAD83 | 31180 | 11/22/2005 15:20 | T0703-051122-10 | Actual | *Non-detect | |
| 12395 | 29.868228 | -89.815961 | NAD83 | 31248 | 11/22/2005 13:50 | T0703-051122-04 | Actual | *Non-detect | |
| 12400 | 29.877503 | -89.813 | NAD83 | 31031 | 11/22/2005 15:00 | T0703-051122-09 | Actual | *Non-detect | |
| 12399 | 29.880288 | -89.812835 | NAD83 | 31132 | 11/22/2005 14:50 | T0703-051122-08 | Actual | *Non-detect | |
| 12398 | 29.877605 | -89.815663 | NAD83 | 31279 | 11/22/2005 14:30 | T0703-051122-07 | Actual | *Non-detect | |
| 12393 | 29.868396 | -89.834241 | NAD83 | 31098 | 11/22/2005 11:35 | T0703-051122-02 | Actual | *Non-detect | |
| 12396 | 29.87042 | -89.815791 | NAD83 | 31104 | 11/22/2005 14:10 | T0703-051122-05 | Actual | *Non-detect | |
| 12397 | 29.873675 | -89.815668 | NAD83 | 31198 | 11/22/2005 14:15 | T0703-051122-06 | Actual | *Non-detect | |
| 12392 | 29.865566 | -89.839805 | NAD83 | 31302 | 11/22/2005 11:05 | T0703-051122-01 | Actual | *Non-detect | |
| 12392 | 29.865566 | -89.839805 | NAD83 | 31048 | 11/22/2005 11:05 | T0703-051122-01 | Actual | *Non-detect | |
| 12394 | 29.867088 | -89.819468 | NAD83 | 31290 | 11/22/2005 12:25 | T0703-051122-03 | Actual | 1905 | cfu/g |
| 12295 | 29.865246 | -89.842508 | NAD83 | 31017 | 11/21/2005 9:55 | T0442-051121-01 | Actual | *Non-detect | |
| 12302 | 29.873088 | -89.834246 | NAD83 | 31107 | 11/21/2005 13:35 | T0442-051121-08 | Actual | *Non-detect | |
| 12303 | 29.872973 | -89.836203 | NAD83 | 31038 | 11/21/2005 13:45 | T0442-051121-09 | Actual | *Non-detect | |
| 12298 | 29.864478 | -89.84939 | NAD83 | 31203 | 11/21/2005 11:05 | T0442-051121-04 | Actual | *Non-detect | |
| 12299 | 29.864475 | -89.839666 | NAD83 | 31145 | 11/21/2005 11:30 | T0442-051121-05 | Actual | *Non-detect | |
| 12297 | 29.868383 | -89.849248 | NAD83 | 31244 | 11/21/2005 10:45 | T0442-051121-03 | Actual | *Non-detect | |

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| 12296 | 29.867201 | -89.849535 | NAD83 | 31142 | 11/21/2005 10:20 | T0442-051121-02 | Actual | *Non-detect | |
| 12304 | 29.870865 | -89.834715 | NAD83 | 31226 | 11/21/2005 14:00 | T0442-051121-10 | Actual | *Non-detect | |
| 12300 | 29.869143 | -89.832848 | NAD83 | 31247 | 11/21/2005 13:10 | T0442-051121-06 | Actual | *Non-detect | |
| 12301 | 29.870938 | -89.833415 | NAD83 | 31165 | 11/21/2005 13:25 | T0442-051121-07 | Actual | *Non-detect | |
| 12295 | 29.865246 | -89.842508 | NAD83 | 31204 | 11/21/2005 9:55 | T0442-051121-01 | Actual | *Non-detect | |
| 11904 | 29.866428 | -89.854095 | NAD83 | 24677 | 11/20/2005 14:45 | T0703-051120-10 | Actual | *Non-detect | |
| 11903 | 29.864411 | -89.851375 | NAD83 | 24676 | 11/20/2005 14:30 | T0703-051120-09 | Actual | *Non-detect | |
| 11896 | 29.867356 | -89.852186 | NAD83 | 24669 | 11/20/2005 11:00 | T0703-051120-02 | Actual | *Non-detect | |
| 11895 | 29.866075 | -89.852983 | NAD83 | 24668 | 11/20/2005 10:20 | T0703-051120-01 | Actual | *Non-detect | |
| 11901 | 29.870435 | -89.856176 | NAD83 | 24674 | 11/20/2005 13:55 | T0703-051120-07 | Actual | *Non-detect | |
| 11902 | 29.86546 | -89.851025 | NAD83 | 24675 | 11/20/2005 14:15 | T0703-051120-08 | Actual | *Non-detect | |
| 11900 | 29.87198 | -89.856516 | NAD83 | 24673 | 11/20/2005 13:40 | T0703-051120-06 | Actual | *Non-detect | |
| 11899 | 29.8677 | -89.856368 | NAD83 | 24672 | 11/20/2005 11:55 | T0703-051120-05 | Actual | *Non-detect | |
| 11897 | 29.86905 | -89.852466 | NAD83 | 24670 | 11/20/2005 11:20 | T0703-051120-03 | Actual | 6078 | cfu/g |
| 11895 | 29.866075 | -89.852983 | NAD83 | 24717 | 11/20/2005 10:20 | T0703-051120-01 | Actual | *Non-detect | |
| 11898 | 29.871581 | -89.85261 | NAD83 | 24671 | 11/20/2005 11:35 | T0703-051120-04 | Actual | *Non-detect | |
| 11843 | 29.864643 | -89.858865 | NAD83 | 24546 | 11/19/2005 15:15 | T0703-051119-07 | Actual | 324030 | cfu/g |
| 11841 | 29.861541 | -89.861833 | NAD83 | 24544 | 11/19/2005 14:45 | T0703-051119-05 | Actual | *Non-detect | |
| 11846 | 29.87027 | -89.861048 | NAD83 | 24549 | 38675.67014 | T0703-051119-10 | Actual | *Non-detect | |
| 11837 | 29.866978 | -89.866918 | NAD83 | 24538 | 11/19/2005 12:10 | T0703-051119-01 | Actual | *Present >QL | |
| 11839 | 29.876055 | -89.866928 | NAD83 | 24542 | 11/19/2005 12:55 | T0703-051119-03 | Actual | 10752 | cfu/g |
| 11844 | 29.860485 | -89.8589 | NAD83 | 24547 | 11/19/2005 15:30 | T0703-051119-08 | Actual | *Non-detect | |
| 11842 | 29.866638 | -89.858881 | NAD83 | 24545 | 11/19/2005 15:05 | T0703-051119-06 | Actual | *Non-detect | |
| 11845 | 29.86883 | -89.860885 | NAD83 | 24548 | 11/19/2005 15:50 | T0703-051119-09 | Actual | *Non-detect | |
| 11837 | 29.866978 | -89.866918 | NAD83 | 24539 | 11/19/2005 12:10 | T0703-051119-01 | Actual | *Present >QL | |
| 11838 | 29.862788 | -89.86681 | NAD83 | 24541 | 11/19/2005 12:35 | T0703-051119-02 | Actual | 490220 | cfu/g |
| 11840 | 29.874103 | -89.866776 | NAD83 | 24543 | 11/19/2005 13:10 | T0703-051119-04 | Actual | 418490 | cfu/g |
| 11806 | 29.88103 | -89.87829 | NAD83 | 24472 | 11/18/2005 12:40 | T1066-051118-05 | Actual | *Non-detect | |
| 11811 | 29.87184 | -89.86663 | NAD83 | 24477 | 11/18/2005 16:30 | T1066-051118-10 | Actual | *Non-detect | |
| 11810 | 29.869595 | -89.866835 | NAD83 | 24476 | 11/18/2005 16:15 | T1066-051118-09 | Actual | 6030 | cfu/g |
| 11804 | 29.875211 | -89.869846 | NAD83 | 24470 | 11/18/2005 12:10 | T1066-051118-03 | Actual | *Non-detect | |
| 11802 | 29.882488 | -89.881241 | NAD83 | 24466 | 11/18/2005 11:30 | T1066-051118-01 | Actual | *Non-detect | |
| 11807 | 29.877001 | -89.869216 | NAD83 | 24473 | 11/18/2005 14:15 | T1066-051118-06 | Actual | *Non-detect | |
| 11803 | 29.879095 | -89.874201 | NAD83 | 24469 | 11/18/2005 11:55 | T1066-051118-02 | Actual | *Non-detect | |
| 11809 | 29.866148 | -89.885431 | NAD83 | 24475 | 11/18/2005 15:50 | T1066-051118-08 | Actual | *Non-detect | |
| 11802 | 29.882488 | -89.881241 | NAD83 | 24467 | 11/18/2005 11:30 | T1066-051118-01 | Actual | *Non-detect | |
| 11808 | 29.869875 | -89.881458 | NAD83 | 24474 | 11/18/2005 15:10 | T1066-051118-07 | Actual | *Non-detect | |
| 11805 | 29.87087 | -89.869896 | NAD83 | 24471 | 11/18/2005 12:25 | T1066-051118-04 | Actual | *Non-detect | |
| 11776 | 29.86088 | -89.8954 | NAD83 | 24418 | 11/17/2005 15:20 | T1066-051117-10 | Actual | 9721 | cfu/g |

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| 11775 | 29.86262 | -89.86956 | NAD83 | 24417 | 11/17/2005 15:05 | T1066-051117-09 | Actual | *Present >QL | |
| 11769 | 29.87116 | -89.89587 | NAD83 | 24411 | 11/17/2005 13:25 | T1066-051117-03 | Actual | *Non-detect | |
| 11772 | 29.87192 | -89.87621 | NAD83 | 24414 | 11/17/2005 14:15 | T1066-051117-06 | Actual | 47157 | cfu/g |
| 11773 | 29.86884 | -89.87161 | NAD83 | 24415 | 11/17/2005 14:35 | T1066-051117-07 | Actual | 22533 | cfu/g |
| 11768 | 29.86362 | -89.89418 | NAD83 | 24410 | 11/17/2005 11:55 | T1066-051117-02 | Actual | *Non-detect | |
| 11770 | 29.864445 | -89.87991 | NAD83 | 24412 | 11/17/2005 13:45 | T1066-051117-04 | Actual | 36495 | cfu/g |
| 11767 | 29.86268 | -89.89138 | NAD83 | 24408 | 11/17/2005 11:45 | T1066-051117-01 | Estimated | 84427 | cfu/g |
| 11771 | 29.86377 | -89.87829 | NAD83 | 24413 | 11/17/2005 14:00 | T1066-051117-05 | Actual | *Non-detect | |
| 11774 | 29.86269 | -89.86963 | NAD83 | 24416 | 11/17/2005 14:50 | T1066-051117-08 | Actual | *Non-detect | |
| 11767 | 29.86268 | -89.89138 | NAD83 | 24407 | 11/17/2005 11:45 | T1066-051117-01 | Estimated | 463510 | cfu/g |
| 11730 | 29.875748 | -89.888206 | NAD83 | 24332 | 11/16/2005 12:30 | T0703-051116-03 | Actual | 637760 | cfu/g |
| 11733 | 29.873548 | -89.885853 | NAD83 | 24335 | 11/16/2005 14:00 | T0703-051116-06 | Actual | 7189 | cfu/g |
| 11728 | 29.874313 | -89.893523 | NAD83 | 24329 | 11/16/2005 11:40 | T0703-051116-01 | Actual | *Non-detect | |
| 11737 | 29.871651 | -89.887875 | NAD83 | 24339 | 11/16/2005 14:50 | T0703-051116-10 | Actual | 31421 | cfu/g |
| 11736 | 29.87162 | -89.890346 | NAD83 | 24338 | 11/16/2005 14:40 | T0703-051116-09 | Actual | 354290 | cfu/g |
| 11728 | 29.874313 | -89.893523 | NAD83 | 24330 | 11/16/2005 11:40 | T0703-051116-01 | Estimated | 78854 | cfu/g |
| 11731 | 29.875491 | -89.886436 | NAD83 | 24333 | 11/16/2005 12:40 | T0703-051116-04 | Actual | 33948 | cfu/g |
| 11735 | 29.869881 | -89.889638 | NAD83 | 24337 | 11/16/2005 14:30 | T0703-051116-08 | Actual | 1115800 | cfu/g |
| 11732 | 29.873685 | -89.884533 | NAD83 | 24334 | 11/16/2005 12:50 | T0703-051116-05 | Actual | 589120 | cfu/g |
| 11729 | 29.873683 | -89.889553 | NAD83 | 24331 | 11/16/2005 12:15 | T0703-051116-02 | Actual | 220810 | cfu/g |
| 11734 | 29.868946 | -89.888503 | NAD83 | 24336 | 11/16/2005 14:15 | T0703-051116-07 | Actual | *Present >QL | |
| 12272 | 29.9109 | -89.905178 | NAD83 | 31303 | 11/15/2005 11:30 | T0335-051115-01 | Actual | *Non-detect | |
| 12272 | 29.9109 | -89.905178 | NAD83 | 31119 | 11/15/2005 11:30 | T0335-051115-01 | Actual | *Non-detect | |
| 12274 | 29.913608 | -89.901735 | NAD83 | 31264 | 11/15/2005 11:55 | T0335-051115-03 | Actual | *Non-detect | |
| 12273 | 29.912191 | -89.903656 | NAD83 | 31270 | 11/15/2005 11:45 | T0335-051115-02 | Actual | *Non-detect | |
| 12276 | 29.915573 | -89.900975 | NAD83 | 31284 | 11/15/2005 12:15 | T0335-051115-05 | Actual | *Non-detect | |
| 12275 | 29.914793 | -89.900145 | NAD83 | 31118 | 11/15/2005 12:10 | T0335-051115-04 | Actual | *Non-detect | |
| 11608 | 29.895113 | -89.898833 | NAD83 | 24120 | 11/14/2005 11:50 | T0335-051114-01 | Estimated | *Non-detect | |
| 11608 | 29.895113 | -89.898833 | NAD83 | 24121 | 11/14/2005 11:50 | T0335-051114-01 | Estimated | 23644 | cfu/g |
| 11612 | 29.914291 | -89.89292 | NAD83 | 24126 | 11/14/2005 13:25 | T0335-051114-05 | Actual | 6022 | cfu/g |
| 11611 | 29.916203 | -89.891748 | NAD83 | 24125 | 11/14/2005 13:10 | T0335-051114-04 | Actual | 2942 | cfu/g |
| 11609 | 29.894683 | -89.89623 | NAD83 | 24123 | 11/14/2005 12:05 | T0335-051114-02 | Actual | *Non-detect | |
| 11610 | 29.91521 | -89.893361 | NAD83 | 24124 | 11/14/2005 13:05 | T0335-051114-03 | Actual | *Non-detect | |
| 11604 | 29.89564 | -89.89597 | NAD83 | 24083 | 11/13/2005 13:35 | T0335-051113-07 | Actual | *Non-detect | |
| 11605 | 29.897825 | -89.896761 | NAD83 | 24084 | 11/13/2005 13:42 | T0335-051113-08 | Actual | *Non-detect | |
| 11606 | 29.897528 | -89.898345 | NAD83 | 24085 | 11/13/2005 13:50 | T0335-051113-09 | Actual | *Non-detect | |
| 11607 | 29.895756 | -89.896633 | NAD83 | 24086 | 11/13/2005 14:00 | T0335-051113-10 | Actual | *Non-detect | |
| 11603 | 29.894233 | -89.897755 | NAD83 | 24082 | 11/13/2005 13:20 | T0335-051113-06 | Actual | *Non-detect | |
| 11582 | 29.91369 | -89.90038 | NAD83 | 23978 | 11/12/2005 14:10 | T0456-051112-08 | Actual | *Non-detect | |

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| 11583 | 29.90851 | -89.90678 | NAD83 | 23979 | 11/12/2005 14:40 | T0456-051112-09 | Actual | *Non-detect | |
| 11584 | 29.89814 | -89.90216 | NAD83 | 23980 | 11/12/2005 15:00 | T0456-051112-10 | Actual | *Non-detect | |
| 11581 | 29.90737 | -89.89754 | NAD83 | 23977 | 11/12/2005 13:50 | T0456-051112-07 | Actual | *Non-detect | |
| 11580 | 29.90494 | -89.89773 | NAD83 | 23976 | 11/12/2005 13:40 | T0456-051112-06 | Actual | *Non-detect | |
| 11580 | 29.90494 | -89.89773 | NAD83 | 23975 | 11/12/2005 13:30 | T0456-051112-06 | Actual | *Non-detect | |
| 11560 | 29.91985 | -89.90637 | NAD83 | 23929 | 11/11/2005 14:20 | T0456-051111-09 | Actual | *Non-detect | |
| 11558 | 29.91649 | -89.89461 | NAD83 | 23927 | 11/11/2005 13:45 | T0456-051111-07 | Actual | *Non-detect | |
| 11559 | 29.92133 | -89.90508 | NAD83 | 23928 | 11/11/2005 14:00 | T0456-051111-08 | Actual | *Non-detect | |
| 11557 | 29.9179 | -89.89092 | NAD83 | 23926 | 11/11/2005 13:30 | T0456-051111-06 | Actual | 135330 | cfu/g |
| 11561 | 29.91566 | -89.91308 | NAD83 | 23930 | 11/11/2005 14:40 | T0456-051111-10 | Actual | *Non-detect | |
| 11535 | 29.90238 | -89.896851 | NAD83 | 23846 | 11/10/2005 11:45 | T0335-051110-02 | Actual | *Non-detect | |
| 11534 | 29.905543 | -89.898603 | NAD83 | 23845 | 11/10/2005 11:00 | T0335-051110-01 | Actual | *Non-detect | |
| 11538 | 29.91163 | -89.903116 | NAD83 | 23849 | 11/10/2005 12:32 | T0335-051110-05 | Actual | *Non-detect | |
| 11536 | 29.908131 | -89.902031 | NAD83 | 23847 | 11/10/2005 12:05 | T0335-051110-03 | Actual | *Non-detect | |
| 11534 | 29.905543 | -89.898603 | NAD83 | 23844 | 11/10/2005 11:00 | T0335-051110-01 | Actual | *Non-detect | |
| 11537 | 29.911331 | -89.898865 | NAD83 | 23848 | 11/10/2005 12:20 | T0335-051110-04 | Actual | *Non-detect | |
| 11507 | 29.90865 | -89.8927 | NAD83 | 23761 | 11/9/2005 11:15 | T0630-051109-01 | Actual | *Non-detect | |
| 11511 | 29.9149 | -89.892 | NAD83 | 23765 | 11/9/2005 12:20 | T0630-051109-05 | Actual | *Non-detect | |
| 11508 | 29.9116 | -89.89011 | NAD83 | 23762 | 11/9/2005 11:40 | T0630-051109-02 | Actual | *Non-detect | |
| 11509 | 29.9146 | -89.88831 | NAD83 | 24706 | 11/9/2005 11:55 | T0630-051109-03 | Actual | *Non-detect | |
| 11510 | 29.91136 | -89.89446 | NAD83 | 23764 | 11/9/2005 12:05 | T0630-051109-04 | Actual | 49081 | cfu/g |
| 11507 | 29.90865 | -89.8927 | NAD83 | 23760 | 11/9/2005 11:15 | T0630-051109-01 | Actual | *Non-detect | |
| 12489 | 29.919321 | -89.915051 | NAD83 | 31044 | 11/8/2005 10:35 | T0335-051108-01 | Actual | 11017 | cfu/g |
| 12491 | 29.918675 | -89.910721 | NAD83 | 31055 | 11/8/2005 11:15 | T0335-051108-03 | Actual | 5346 | cfu/g |
| 12490 | 29.922103 | -89.909501 | NAD83 | 31082 | 11/8/2005 11:00 | T0335-051108-02 | Actual | 8039 | cfu/g |
| 12489 | 29.919321 | -89.915051 | NAD83 | 31006 | 11/8/2005 10:35 | T0335-051108-01 | Actual | 19235 | cfu/g |
| 11470 | 29.920945 | -89.913745 | NAD83 | 22384 | 11/7/2005 12:00 | T0335-051107-03 | Actual | *Non-detect | |
| 11469 | 29.92414 | -89.909771 | NAD83 | 22383 | 11/7/2005 11:45 | T0335-051107-02 | Actual | *Non-detect | |
| 11468 | 29.925201 | -89.911263 | NAD83 | 22381 | 11/7/2005 11:40 | T0335-051107-01 | Actual | *Non-detect | |
| 11469 | 29.92414 | -89.909771 | NAD83 | 22382 | 11/7/2005 11:45 | T0335-051107-02 | Actual | *Non-detect | |
| 11439 | 29.92392 | -89.906778 | NAD83 | 22293 | 11/6/2005 13:55 | T0630-051106-03 | Actual | *Non-detect | |
| 11437 | 29.927041 | -89.90561 | NAD83 | 22291 | 11/6/2005 13:25 | T0630-051106-01 | Actual | 2611 | cfu/g |
| 11438 | 29.928005 | -89.902465 | NAD83 | 22292 | 11/6/2005 13:45 | T0630-051106-02 | Actual | *Non-detect | |
| 11440 | 29.931661 | -89.902698 | NAD83 | 22294 | 11/6/2005 14:10 | T0630-051106-04 | Actual | *Non-detect | |
| 11319 | 29.922727 | -89.901103 | NAD83 | 22124 | 11/4/2005 10:55 | T0924-051104-03 | Actual | 74181 | cfu/g |
| 11318 | 29.924126 | -89.902808 | NAD83 | 22123 | 11/4/2005 10:35 | T0924-051104-02 | Actual | *Non-detect | |
| 11300 | 29.902271 | -89.901611 | NAD83 | 22064 | 11/3/2005 11:45 | T0924-051103-02 | Estimated | 119770 | cfu/g |
| 11301 | 29.919976 | -89.891868 | NAD83 | 22065 | 11/3/2005 12:20 | T0924-051103-03 | Actual | 11198 | cfu/g |
| 11300 | 29.902271 | -89.901611 | NAD83 | 22063 | 11/3/2005 11:45 | T0924-051103-02 | Estimated | *Present >QL | |

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| 11299 | 29.867038 | -89.813075 | NAD83 | 22062 | 11/3/2005 11:00 | T0924-051103-01 | Actual | *Non-detect | |
| 12436 | 29.940426 | -89.931176 | NAD83 | 31236 | 11/2/2005 11:50 | T0924-051102-02 | Actual | *Non-detect | |
| 12435 | 29.925781 | -89.907486 | NAD83 | 31170 | 11/2/2005 11:20 | T0924-051102-01 | Actual | *Non-detect | |
| 12434 | 29.86165 | -89.897578 | NAD83 | 31010 | 11/1/2005 11:20 | T0924-051101-03 | Estimated | *Non-detect | |
| 12433 | 29.881411 | -89.894073 | NAD83 | 31032 | 11/1/2005 10:25 | T0924-051101-02 | Actual | 4302 | cfu/g |
| 12432 | 29.897168 | -89.897595 | NAD83 | 31189 | 11/1/2005 9:40 | T0924-051101-01 | Actual | 2568 | cfu/g |
| 12434 | 29.86165 | -89.897578 | NAD83 | 31161 | 11/1/2005 11:20 | T0924-051101-03 | Estimated | 116450 | cfu/g |
| 12481 | 29.900261 | -89.898983 | NAD83 | 31169 | 10/31/2005 11:15 | T0335-051031-03 | Actual | *Non-detect | |
| 12480 | 29.86276 | -89.797543 | NAD83 | 31127 | 10/31/2005 10:35 | T0335-051031-02 | Actual | *Non-detect | |
| 12481 | 29.900261 | -89.898983 | NAD83 | 31168 | 10/31/2005 11:15 | T0335-051031-03 | Actual | *Non-detect | |
| 9906 | 29.86752 | -89.846331 | WGS84 | 17270 | 9/26/2005 13:35 | RS166-TD-G-N-09 | Actual | *Non-detect | |
| 9902 | 29.871438 | -89.813368 | WGS84 | 17265 | 9/26/2005 11:30 | RS162-TD-G-N-09 | Actual | *Non-detect | |
| 9905 | 29.864913 | -89.842676 | WGS84 | 17269 | 9/26/2005 13:15 | RS165-TD-G-N-09 | Actual | *Non-detect | |
| 9907 | 29.866841 | -89.850403 | WGS84 | 17271 | 9/26/2005 14:00 | RS167-TD-G-N-09 | Actual | *Non-detect | |
| 9902 | 29.871438 | -89.813368 | WGS84 | 17266 | 9/26/2005 11:30 | RS162-TD-G-D-09 | Actual | *Non-detect | |
| 9904 | 29.870411 | -89.834828 | WGS84 | 17268 | 9/26/2005 12:30 | RS164-TD-G-N-09 | Actual | *Non-detect | |
| 9901 | 29.866861 | -89.809356 | WGS84 | 17264 | 9/26/2005 11:00 | RS161-TD-G-N-09 | Actual | 5180 | cfu/g |
| 9903 | 29.866878 | -89.817818 | WGS84 | 17267 | 9/26/2005 12:00 | RS163-TD-G-N-09 | Actual | *Present >QL | |
| 9900 | 29.867785 | -89.802163 | WGS84 | 17263 | 9/26/2005 10:30 | RS160-TD-G-N-09 | Actual | 1792 | cfu/g |
| 9883 | 29.877756 | -89.878613 | WGS84 | 17243 | 9/26/2005 13:00 | RS409-kk-G-N-09 | Actual | 33795 | cfu/g |
| 9880 | 29.874385 | -89.88525 | WGS84 | 17240 | 9/26/2005 12:10 | RS406-kk-G-N-09 | Actual | *Present >QL | |
| 9878 | 29.871831 | -89.878886 | WGS84 | 17238 | 9/26/2005 11:15 | RS404-kk-G-D-09 | Estimated | 23491 | cfu/g |
| 9879 | 29.873431 | -89.876066 | WGS84 | 17239 | 9/26/2005 11:40 | RS405-kk-G-N-09 | Actual | 6357 | cfu/g |
| 9878 | 29.871831 | -89.878886 | WGS84 | 17237 | 9/26/2005 11:15 | RS404-kk-G-N-09 | Estimated | 118990 | cfu/g |
| 9882 | 29.881515 | -89.887703 | WGS84 | 17242 | 9/26/2005 12:40 | RS408-kk-G-N-09 | Actual | *Non-detect | |
| 9874 | 29.871946 | -89.866795 | WGS84 | 17233 | 9/26/2005 10:00 | RS400-kk-G-N-09 | Actual | 17835 | cfu/g |
| 9875 | 29.863755 | -89.869316 | WGS84 | 17234 | 9/26/2005 10:25 | RS401-kk-G-N-09 | Actual | *Non-detect | |
| 9877 | 29.863558 | -89.88008 | WGS84 | 17236 | 9/26/2005 11:00 | RS403-kk-G-N-09 | Actual | *Non-detect | |
| 9876 | 29.864946 | -89.872563 | WGS84 | 17235 | 9/26/2005 10:35 | RS402-kk-G-N-09 | Actual | *Non-detect | |
| 10269 | 29.9529 | -89.96217 | NAD83 | 18186 | 9/25/2005 0:00 | RS410-KK-G-N-09 | Actual | *Non-detect | |
| 10268 | 29.93967 | -89.95827 | NAD83 | 18185 | 9/25/2005 0:00 | RS409-KK-G-N-09 | Actual | *Non-detect | |
| 9459 | 29.9603 | -89.97039 | WGS84 | 16771 | 9/17/2005 9:40 | RS516-TD-G-N-09 | Actual | 13079 | cfu/g |
| 9454 | 29.957728 | -89.989125 | WGS84 | 16774 | 9/17/2005 11:35 | RS519-TD-G-N-09 | Actual | *Non-detect | |
| 9455 | 29.96497 | -89.99039 | WGS84 | 16775 | 9/17/2005 12:10 | RS520-TD-G-N-09 | Actual | 23808 | cfu/g |
| 9458 | 29.966116 | -90.001725 | WGS84 | 16778 | 9/17/2005 14:50 | RS522-TD-G-N-09 | Actual | *Non-detect | |
| 9453 | 29.959481 | -89.982351 | WGS84 | 16773 | 9/17/2005 11:05 | RS518-TD-G-N-09 | Actual | 2940 | cfu/g |
| 9456 | 29.96956 | -89.997095 | WGS84 | 16777 | 9/17/2005 14:10 | RS521-TD-G-D-09 | Actual | *Non-detect | |
| 9456 | 29.96956 | -89.997095 | WGS84 | 16776 | 9/17/2005 14:10 | RS521-TD-G-N-09 | Actual | *Non-detect | |
| 9460 | 29.955925 | -89.979865 | WGS84 | 16772 | 9/17/2005 10:35 | RS517-TD-G-N-09 | Actual | *Non-detect | |

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| 8957 | 29.954905 | -90.007085 | WGS84 | 16317 | 9/12/2005 12:25 | RS066-TD-G-D-09 | Actual | *Non-detect | |
| 8957 | 29.954905 | -90.007085 | WGS84 | 16318 | 9/12/2005 12:25 | RS066-TD-G-N-09 | Actual | *Non-detect | |
| 8954 | 29.945645 | -89.97905 | WGS84 | 16314 | 9/12/2005 11:00 | RS063-TD-G-N-09 | Actual | *Non-detect | |
| 8955 | 29.948695 | -89.99367 | WGS84 | 16315 | 9/12/2005 11:30 | RS064-TD-G-N-09 | Actual | *Non-detect | |
| 8941 | 29.936131 | -89.952953 | WGS84 | 16299 | 9/12/2005 13:13 | RS044-JC-G-N-09 | Actual | 9603 | cfu/g |
| 8953 | 29.94751 | -89.975525 | WGS84 | 16313 | 9/12/2005 10:30 | RS062-TD-G-N-09 | Actual | *Non-detect | |
| 8952 | 29.95482 | -89.97224 | WGS84 | 16326 | 9/12/2005 9:50 | RS061-TD-G-N-09 | Actual | *Non-detect | |
| 8956 | 29.95588 | -89.997845 | WGS84 | 16316 | 9/12/2005 12:00 | RS065-TD-G-N-09 | Actual | *Non-detect | |
| 8940 | 29.942006 | -89.961045 | WGS84 | 16298 | 9/12/2005 12:56 | RS043-JC-G-N-09 | Actual | 64207 | cfu/g |
| 8939 | 29.949616 | -89.957698 | WGS84 | 16322 | 9/12/2005 12:35 | RS042-JC-G-N-09 | Actual | 78976 | cfu/g |
| 8937 | 29.955385 | -89.955743 | WGS84 | 16295 | 9/12/2005 12:17 | RS041-JC-G-N-09 | Actual | *Non-detect | cfu/g |
| 8934 | 29.938703 | -89.936136 | WGS84 | 16292 | 9/12/2005 10:43 | RS018-JC-G-N-09 | Actual | *Non-detect | |
| 8935 | 29.938121 | -89.942215 | WGS84 | 16293 | 9/12/2005 11:04 | RS019-JC-G-N-09 | Actual | *Non-detect | |
| 8936 | 29.941475 | -89.95087 | WGS84 | 16294 | 9/12/2005 11:29 | RS020-JC-G-N-09 | Actual | 17450 | cfu/g |
| 12281 | 29.961345 | -89.985275 | NAD83 | 31093 | 11/15/2005 14:25 | T0335-051115-10 | Actual | *Non-detect | |
| 12277 | 29.954981 | -89.984885 | NAD83 | 31181 | 11/15/2005 13:40 | T0335-051115-06 | Actual | *Non-detect | |
| 12280 | 29.961345 | -89.986088 | NAD83 | 31076 | 11/15/2005 14:10 | T0335-051115-09 | Actual | *Non-detect | |
| 12279 | 29.957846 | -89.987851 | NAD83 | 31212 | 11/15/2005 13:55 | T0335-051115-08 | Actual | *Non-detect | |
| 12278 | 29.956538 | -89.988371 | NAD83 | 31085 | 11/15/2005 13:50 | T0335-051115-07 | Actual | *Non-detect | |
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| 11617 | 29.965811 | -89.994563 | NAD83 | 24131 | 11/14/2005 14:20 | T0335-051114-10 | Actual | *Non-detect | |
| 11615 | 29.96711 | -89.993306 | NAD83 | 24129 | 11/14/2005 14:10 | T0335-051114-08 | Actual | *Non-detect | |
| 11614 | 29.96216 | -89.99589 | NAD83 | 24128 | 11/14/2005 14:00 | T0335-051114-07 | Actual | 2755 | cfu/g |
| 11613 | 29.96302 | -89.998681 | NAD83 | 24127 | 11/14/2005 13:45 | T0335-051114-06 | Actual | *Present >QL | |
| 11601 | 29.966361 | -89.99053 | NAD83 | 24079 | 11/13/2005 11:25 | T0335-051113-04 | Actual | *Non-detect | |
| 11600 | 29.957891 | -89.976075 | NAD83 | 24078 | 11/13/2005 11:05 | T0335-051113-03 | Actual | *Non-detect | |
| 11599 | 29.96104 | -89.977616 | NAD83 | 24077 | 11/13/2005 10:50 | T0335-051113-02 | Actual | *Non-detect | |
| 11602 | 29.969816 | -89.991836 | NAD83 | 24081 | 11/13/2005 11:45 | T0335-051113-05 | Actual | *Non-detect | |
| 11598 | 29.964125 | -89.975758 | NAD83 | 24075 | 11/13/2005 10:15 | T0335-051113-01 | Actual | *Non-detect | |
| 11598 | 29.964125 | -89.975758 | NAD83 | 24076 | 11/13/2005 10:15 | T0335-051113-01 | Actual | *Non-detect | |
| 11575 | 29.95993 | -90.00216 | NAD83 | 23969 | 11/12/2005 10:20 | T0456-051112-01 | Actual | *Non-detect | |
| 11576 | 29.95379 | -90.00713 | NAD83 | 23970 | 11/12/2005 10:50 | T0456-051112-02 | Actual | 152950 | cfu/g |
| 11578 | 29.95136 | -89.97077 | NAD83 | 23972 | 11/12/2005 11:40 | T0456-051112-04 | Actual | *Non-detect | |
| 11577 | 29.95374 | -90.00019 | NAD83 | 23971 | 11/12/2005 11:15 | T0456-051112-03 | Actual | *Non-detect | |
| 11579 | 29.96266 | -89.9697 | NAD83 | 23973 | 11/12/2005 12:00 | T0456-051112-05 | Actual | *Non-detect | |
| 11555 | 29.96127 | -89.98843 | NAD83 | 23924 | 11/11/2005 12:20 | T0456-051111-04 | Actual | *Non-detect | |
| 11553 | 29.9431 | -89.9766 | NAD83 | 23922 | 11/11/2005 11:30 | T0456-051111-02 | Estimated | 50557 | cfu/g |
| 11556 | 29.96775 | -89.98697 | NAD83 | 23925 | 11/11/2005 12:39 | T0456-051111-05 | Actual | *Non-detect | |
| 11554 | 29.95513 | -89.99433 | NAD83 | 23923 | 11/11/2005 12:00 | T0456-051111-03 | Actual | 1294 | cfu/g |

| Station ID | Latitude | Longitude | Horiz. Dat. | Activity ID | Activity Start | Activity Comment | Value Type | Result Value | Units |
|---|---|---|---|---|---|---|---|---|---|
| 11553 | 29.9431 | -89.9766 | NAD83 | 23921 | 11/11/2005 11:40 | T0456-051111-02 | Estimated | *Non-detect | |
| 11552 | 29.94149 | -89.97292 | NAD83 | 23920 | 11/11/2005 10:40 | T0456-051111-01 | Actual | 5393 | cfu/g |
| 11540 | 29.949353 | -89.977243 | NAD83 | 23851 | 11/10/2005 13:27 | T0335-051110-07 | Actual | *Non-detect | |
| 11541 | 29.948728 | -89.975628 | NAD83 | 23852 | 11/10/2005 13:43 | T0335-051110-08 | Actual | *Non-detect | |
| 11539 | 29.94454 | -89.974545 | NAD83 | 23850 | 11/10/2005 12:55 | T0335-051110-06 | Actual | *Non-detect | |
| 11543 | 29.948945 | -89.98857 | NAD83 | 23854 | 11/10/2005 14:17 | T0335-051110-10 | Actual | *Non-detect | |
| 11542 | 29.953211 | -89.985573 | NAD83 | 23853 | 11/10/2005 14:05 | T0335-051110-09 | Actual | *Non-detect | |
| 11514 | 29.95791 | -89.96604 | NAD83 | 23768 | 11/9/2005 13:25 | T0630-051109-08 | Actual | *Non-detect | |
| 11515 | 29.95265 | -89.96897 | NAD83 | 23769 | 11/9/2005 13:35 | T0630-051109-09 | Actual | *Non-detect | |
| 11516 | 29.95705 | -89.97179 | NAD83 | 23770 | 11/9/2005 13:45 | T0630-051109-10 | Actual | 4490 | cfu/g |
| 11513 | 29.96087 | -89.96536 | NAD83 | 23767 | 11/9/2005 13:15 | T0630-051109-07 | Actual | *Non-detect | |
| 11512 | 29.95617 | -89.96043 | NAD83 | 23766 | 11/9/2005 12:45 | T0630-051109-06 | Actual | *Non-detect | |
| 12492 | 29.943808 | -89.967951 | NAD83 | 31131 | 11/8/2005 11:40 | T0335-051108-04 | Actual | 47375 | cfu/g |
| 12494 | 29.948108 | -89.971968 | NAD83 | 31172 | 11/8/2005 12:45 | T0335-051108-06 | Actual | *Non-detect | |
| 12493 | 29.949025 | -89.967606 | NAD83 | 31052 | 11/8/2005 12:30 | T0335-051108-05 | Actual | *Non-detect | |
| 11472 | 29.948416 | -89.961323 | NAD83 | 22386 | 11/7/2005 12:42 | T0335-051107-05 | Actual | 9204 | cfu/g |
| 11471 | 29.944676 | -89.964101 | NAD83 | 22385 | 11/7/2005 12:25 | T0335-051107-04 | Actual | 412660 | cfu/g |
| 11473 | 29.952761 | -89.963383 | NAD83 | 24705 | 11/7/2005 12:54 | T0335-051107-06 | Actual | *Non-detect | |
| 12437 | 29.9451 | -89.97258 | NAD83 | 31217 | 11/2/2005 13:20 | T0924-051102-03 | Actual | 7166 | cfu/g |
| 12482 | 29.941356 | -89.963403 | NAD83 | 31282 | 10/31/2005 11:45 | T0335-051031-04 | Actual | *Non-detect | |
| 10211 | 29.948508 | -89.993741 | NAD83 | 17999 | 10/1/2005 12:40 | T0139-051001-09 | Actual | *Non-detect | |
| 10210 | 29.947488 | -89.986501 | NAD83 | 17998 | 10/1/2005 12:15 | T0139-051001-08 | Actual | *Non-detect | |
| 10209 | 29.949145 | -89.983196 | NAD83 | 17997 | 10/1/2005 11:55 | T0139-051001-07 | Actual | *Non-detect | |
| 10212 | 29.960463 | -89.974693 | NAD83 | 18001 | 10/1/2005 13:15 | T0139-051001-10 | Actual | *Non-detect | |
| 10205 | 29.955848 | -89.979563 | NAD83 | 17993 | 10/1/2005 10:10 | T0139-051001-03 | Actual | *Non-detect | |
| 10206 | 29.961013 | -89.972171 | NAD83 | 17994 | 10/1/2005 10:45 | T0139-051001-04 | Actual | *Non-detect | |
| 10204 | 29.957933 | -89.989653 | NAD83 | 17992 | 10/1/2005 9:50 | T0139-051001-02 | Actual | *Non-detect | |
| 10203 | 29.956455 | -89.998298 | NAD83 | 17991 | 10/1/2005 9:02 | T0139-051001-01 | Actual | *Non-detect | |
| 10207 | 29.955463 | -89.9733 | NAD83 | 17995 | 10/1/2005 11:10 | T0139-051001-05 | Actual | *Non-detect | |
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| 10177 | 29.960323 | -89.984043 | NAD83 | 17898 | 9/30/2005 15:35 | T0232-050930-14 | Actual | *Non-detect | |
| 10176 | 29.964925 | -89.990581 | NAD83 | 17897 | 9/30/2005 15:25 | T0232-050930-13 | Actual | 7871 | cfu/g |
| 10175 | 29.96951 | -89.997128 | NAD83 | 17896 | 9/30/2005 15:05 | T0232-050930-12 | Actual | 38989 | cfu/g |
| 10173 | 29.954975 | -90.007116 | NAD83 | 17893 | 9/30/2005 14:38 | T0232-050930-10 | Actual | *Non-detect | |
| 10174 | 29.965878 | -90.0018 | NAD83 | 17894 | 9/30/2005 14:45 | T0232-050930-11 | Estimated | 31485 | cfu/g |
| 10174 | 29.965878 | -90.0018 | NAD83 | 17895 | 9/30/2005 14:45 | T0232-050930-11 | Estimated | 3476 | cfu/g |

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**14. ABSTRACT**
Multiple failures of the levee system protection for the City of New Orleans in the aftermath of Hurricane Katrina in August 2005 led to the flooding of the metropolitan area. The floodwaters and sediments contained some dissolved and entrained chemical and microbial contaminants. Subsequent pumping of floodwater from the city to the adjacent environment and the ongoing removal of sediment and sediment-coated debris are potential mechanisms to distribute these contaminants to the local environment. The recalcitrant hydrocarbon benzo[a]pyrene (BaP) was used as an indicator of hydrophobic organic contaminants and microbial and sterol indicators of fecal material to assess sources and sinks of these classes of contaminants. These data provided a basis for contaminant transport and fate models. Additionally, this report specifically focuses on the Violet Marsh area outside the levee from the Lower Ninth Ward of New Orleans and on the Chalmette area of St. Bernard Parish, looking at potential environmental impacts.
Water fecal coliform counts (colony forming units (cfu) per 100 mL of water) ranged from 100 to 490,000 (mean=21,381, standard deviation=74,541, median=2,200) in New Orleans proper, 10 to 30,000 (mean=3,308, SD=8,093, median=200) in New Orleans East, and 17 to 25,000 (mean=1,287, SD=4,381, median= 100) in St. Bernard Parish and the Lower Ninth Ward polders. The LADEQ primary contact recreational water quality criterion for fecal coliforms is 400 cfu/100 mL.
(Continued)

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**14. ABSTRACT (continued)**

Floodwater in all three polders frequently exceeded this standard, and no trend (increasing or decreasing cfu/100 mL) was evident with time as the water was pumped out. BaP levels in water (µg/L) were all non-detect except one data point at 0.42 µg/L in New Orleans proper. BaP is a hydrophobic organic contaminant that would tend to sorb to sediment particles and settle from the water standing in the city.

Comparison of the levels of indicators in the surface of sediment cores to those in the bottoms of the cores shows that Violet Marsh has had a history of fecal and BaP contamination, much presumably coming primarily from the sewage treatment plant that drains into Bayou Bienvenue. The flooding of New Orleans and the subsequent pumpout resulted in higher levels of fecal material and BaP in the surface sediments of the marsh and a wider distribution of these contaminants throughout the marsh.